VOL. XVI., No. 25 CHICAGO, DECEMBER 16, 1909 $3.00 PER YEAR

MOTOR AGE

ILLINOIS STARTS SIGNBOARD CAMPAIGN

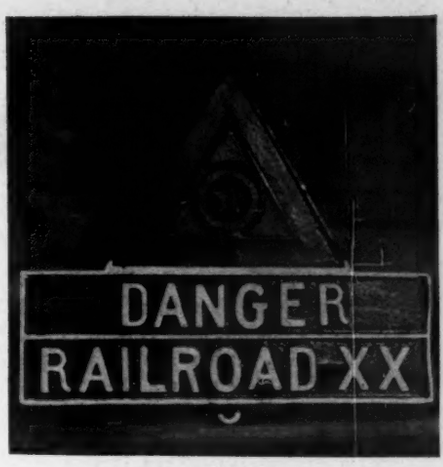
SEVEN-SIGN POST ON ELGIN ROUTE

Chicago Motor Club Marks Four Routes To Show State How to Properly Mark Roads

CHICAGO, Dec. 13—The Chicago Motor Club is just bringing to a successful completion a campaign for signboarding the country hereabouts which has been spread over 2 years and which has engaged the services of an energetic committee which has gone about the thing in such a scientific manner that it is thought the ground work has been laid for a system that eventually will mark the country roads in as effective a manner as are city streets, so that your motorist can travel from town to town in Illinois, Indiana and Wisconsin without having to stop at exery cross roads to inquire the way. If the calculations of this committee prove correct all the motorists of the future will have to do when he comes to a strange crossroads is to the consult the cast iron signboard of the Chicago Motor Club.

In laying this foundation the Chicago Motor Club has been wise enough to peer into the future and realize that eventually this signboarding must be attended to by the various counties because of the fact that when the posts are put up through a private enterprise like this there is nothing to protect the post and its sign from the depredations of those miscreants who find their enjoyment in destroying something that has been put up by other than official authority. Then, too, the cost of such signboarding is so great that it is folly to expect motoring interests to stand all the expense. Therefore the Chicago Motor Club has figured that by taking four of the big trunk lines running out of Chicago and properly marking them that this will be an object lesson with which it and the allied interests may go before the county supervisors and ask that all roads be treated in a similar manner. Also, after this education has been completed, it will be possible to invoke the aid of the legislature either to compel the enforcement of the old law or enact a new one that will make it compulsory on the part of the road supervisors to see that all the roads in their respective territories are properly marked.

Much of the antipathy toward motoring enterprises may be done away with by this educational step taken by the Chicago Motor Club. If the farmers see that the motorists are willing to bear their share of the expenses and that the object of the motorists is for the common good then they will be more amenable to reason and in another 5 years it will come easy for the road supervisors to attend to this part of the work of signboarding the roads.



"DANGER—RAILROAD CROSSING" SIGN

OLD AND NEW METHOD OF SIGNBOARDING

With the groundwork well laid through the enterprise and hustle of the signboard committee, at the head of which Joseph V. Lawrence has served for the past 2 years, the Chicago Motor Club proposes to have for two cardinal points of its compass good roads and signboards, believing that they are the cornerstones to motoring success in this vicinity. But the club also believes there should be a community of interests and that success in both these

STEEP HILL DANGER SIGN

BAD TURN DANGER SIGN

RANDOLPH TRUCK CARRYING SIGNBOARD SUPPLIES

departments only can be achieved by the banding together of the leading clubs and organizations; that success only can be achieved in this manner.

The signboard campaign really started some 4 years back when the Illinois signboard commission was formed and nearly $100 raised by popular subscription to push the work along. Some signboards were purchased and a few put up, then interest in the commission slackened and eventually the Chicago Motor Club fell heir to the entire proposition. Then it was realized that an organization scheme would have to be mapped out and the scheme followed through to the end. It was like a huge business enterprise and had to be carried through slowly. First of all, financial support had to be sought, then the organization completed, the routes pegged out, the signs ordered and finally put up. All this has required time and for the last 2 years Chairman Lawrence and his commission has been at work on it. It was not until the last month, though, that the motor club was able to point with pride to the success that has attended its efforts.

Chairman Lawrence's Surprise

When Chairman Lawrence arose at the annual meeting of the Chicago Motor Club a week ago and announced that he had practically finished three of the four routes selected and that the last one would be completed inside a couple of weeks, weather favoring him, he surprised the lay members of the club who had not known much of the progress of the campaign, so quietly had Chairman Lawrence worked. Without any blare on the publicity trumpet Lawrence has quietly sent out his forces and when he finishes this month he will have expended $2,000 in signs and will have put up 290 posts on which will have been placed 787 signs. Furthermore, as a monument to the enterprise of the Chicago Motor Club there will be located at the corner of Jackson boulevard and Michigan avenue in Chicago—the north pole of this motoring expedition—a huge tablet on which will be the direction and mileage of nearly every town of importance within a radius of 100 miles of this city.

Ready for touring next summer will be four routes. The first one completed is to Beloit, the signs blazing the trail by way of Elgin, Algonquin and Lake Delevan. Another route will be to Lake Geneva by way of Rogers Park, Niles Center, Wheeling, Wauconda and Geona Junction, which route was made possible by E. E. Ayer, who contributed $500 for marking this course. Both these are done at the present time. The route to Milwaukee has been completed to within 15 miles of the Cream City, its work being stopped there because of the condition of the roads which, being muddy, would not permit of the expedition making much progress. As soon as the ground is frozen this work will be completed, the Chicago Motor Car Co., Packard agent, having agreed to finance the proposition. This leaves only the Chicago-South Bend route to be marked, and it is proposed to go at this at once so that by New Year's the four great trunk lines runing out of Chicago will have to be completed.

Chairman Lawrence then will have completed his task. It being done he is ready to step down and let others carry on the work. This the motor club proposes to do in an energetic manner, it being the idea to interest other clubs and organizations with the idea of appealing to the legislature for help in this direction.

BORING A POST HOLE

Plan of the Campaign

The plan of campaign followed by Lawrence and his colleagues was most businesslike. He realized that it would be impossible to start at it hit and miss, so the first thing he did was to send out expeditions to mark the various courses. To do this Berne Nadall of the committee devised a most comprehensive chart, there being a card for each post on which was marked the route, the peg number, the distance from one point to another by odometer reading. Then came three cross-road maps in outline. One showed the con-

FIXING SIGNS TO TAMARACK POST ON THE ROAD

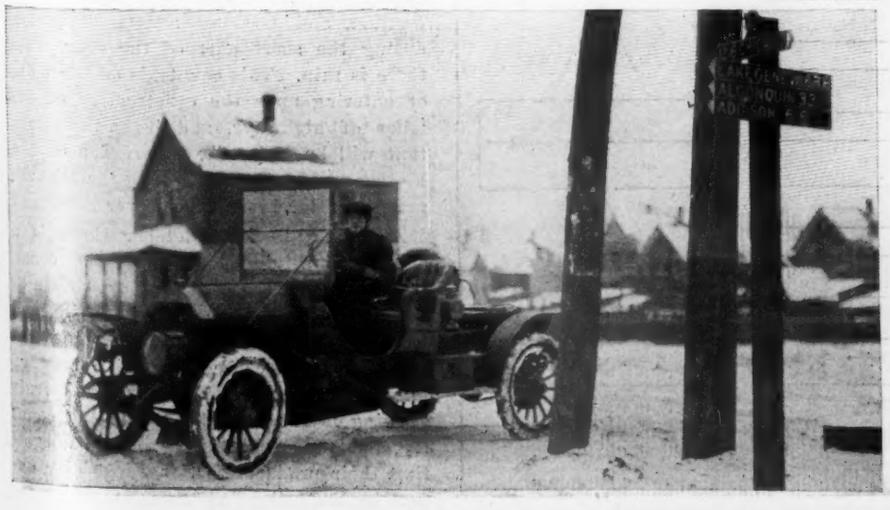
A Chicago Motor Club Sign

Chicago Motor Club Workmen Erecting a Sign

ventional four corners and on it could be marked just where the post should go. Another showed two roads converging into one that could be marked in the same manner. A third showed a right turn, a left turn and a railroad crossing. In another part of the chart were the various signboards that were to be put up and the pegger could designate just which one could be used. In this manner Lawrence and his forces went over the four routes and had all the data required before the signs were ordered. Then the chairman sought bids for the work. It was not his intention to actually put up the signs himself, believing that the work could be done better by paying for it than it could by relying on volunteers. And so it has proved.

From the Featherstone Foundry and Machine Co. the signboard committee secured a bid for the signs. The price agreed on was 65 cents for a cast iron sign 20 inches long and 4 inches wide; for a double sign the price was $1.15 and for a triple sign $1.75. Where more signs were required on one post it was possible to use s veral of these styles in combination as for instance the Latrobe steel mills sign at Melrose Park on the way to Elgin there is a sign on which there are seven tags. In all 787 signs were ordered, the aggregate cost of which was in the neighborhood of $600. Then it came to the selection of posts on which these signs could be placed. The contract for these was placed with the Hines Lumber Co., which furnished 290 tamarack posts 12 feet long and 4 inches square at a cost of $22 a thousand feet, the total cost being approximately $100.

Equipped with supplies Chairman Lawrence then sought for someone to put up the posts and signs, finally entering into a contract with Joseph T. Elmore and Herbert J. Ross, of the Chicago Ad-Sign Co., to paint, deliver and erect these signs on the different routes at $3.55 a post, the contract netting approximately $1,000. The contract called for painting the posts with creosote paint, painting the signs themselves with non-rusting paint, painting the letters in white enamel, boring holes in the signs by which they could be fastened to the posts, attaching the signs and then putting up the posts in holes 4 feet deep. This completed it was necessary to anchor and tamp each post.



Stoddard-Dayton at One of Elgin Course Turns Marked by Sign

Randolph Truck Used

Under the contract Elmore and Ross were to provide their own means of transportation. They had intended using a horse and wagon but Chairman Lawrence was in a hurry to complete the work so he secured from the Randolph Motor Car Co. of Chicago the use of one of the company's light trucks, the Randolph company cheerfully donating the use of the machine, but Elmore and Ross paying the expenses of the expedition and the salary of the driver. The Randolph truck proved of greatest benefit to the commission. Much ground could be covered in a day and despite the adverse weather conditions the truck has been on the job at all times, never giving the expedition the slightest trouble and covering many miles in the course of the day.

The way Elmore and Ross work is to ship a supply of posts and signs along each route, dropping a bunch every 30 miles. Then they come along in the Randolph truck, pick up the supply and place them in the next 30 miles of territory. It requires two men to place the signs. As one man is digging the 4-foot hole in the ground the other is attaching the sign to the post. It takes about 3 hours to place a post and sometimes more, according to the conditions. At the Latrobe steel mills it took 1 day because the ground there is made of steel filings, which made the work specially laborious. In favorable weather the expedition can label a 100-mile course in 1 week.

Obstructions Are Encountered

Chairman Lawrence reports that his chief difficulty in laying out his routes was to get the necessary permits from the various townships, it being necessary to make several trips to each before these permits would be issued. He found in many places

that there was opposition to the idea, the villages declaring they did not want the signs up because that would bring motorists through their towns, which they apparently did not want. However, after the expenditure of considerable time all these permits were secured. In some places, though, Lawrence was greeted with open arms by the villagers who were sufficiently broad-minded to welcome the innovation. At Bloomingdale, on the Elgin route, Lawrence found unexpected co-operation. He had secured the permit and a sign had been erected in that village. It was no sooner up, though, than the report came that some farmers had taken it down and moved it to a point 2 miles distant for the purpose of misleading the motorists. Just as Lawrence was prepared to investigate the selectmen of the town acted. They held a meeting and ordered the farmers to put the sign back where it belonged under penalty of prosecution inside of a week. The sign was moved at once. Another difficulty encountered is in securing permission from the Chicago park commissioners to put up signs on the boulevards, but Chairman Lawrence believes that eventually he will be able to convince the commissioners of the need of such guide posts. When the permission is secured signs will be placed in Chicago.

In summing up the situation and the expense, Chairman Lawrence finds that in addition to the cost of $3.55 a post there must be added the sum of 15 cents a mile for pegging out the routes preliminary to putting up the signs. The funds for marking these routes were raised by subscriptions, Chairman Lawrence not having to call on the club for financial assistance, although the club stood ready to back him up with money in case he had needed it.

Coast Starts the Campaign Right

SAN DIEGO, CAL., Dec. 12—It is a far cry from the Pacific coast to the Atlantic when one seeks aid, but the residents of this section have not hesitated to make it in getting the best available man to take charge of the construction of good highways, and so Austin B. Fletcher, for the past 5 years secretary of the Massachusetts highway commission, has been chosen to fill the position. He has just been here on a visit and after going over the matter thoroughly he has accepted the office. A few days ago he left for Boston to tender his resignation there and he will be back here about the first of the new year ready to begin his duties. Mr. Fletcher is perhaps better known outside of his own state than he is at home, for he is so quiet and modest he never gets into print. But behind all his quietness there is a capability for work that is well known by the members of the Massachusetts highway commission. Naturally they were loath to let him go, but they did not wish to stand in the way of his advancement. At some of the road conventions held here and abroad Mr. Fletcher was present and his papers on highway construction have won much praise. That is why he came under the notice of the people here who have started on a new era of road construction.

While the gospel of good roads has been spreading all over the country, the south and the west have been particularly active in taking up the matter. Committees have been sent east, particularly to Massachusetts, where the Bay state has been working out the problem for something like 16 years, and now has about 800 miles of state highway finished. In no state, however, has the good roads gospel taken a greater hold than in California, and now with large appropriations ready to be spent, by securing men like Mr. Fletcher much money will be saved the state, for there will be no need of experimenting or going over the ground that has been covered by Massachusetts. Accustomed for a great many years to the poorest kind of highways, in many places little better than trails, California suddenly has awakened to the need of improvement, and from end to end of the state the counties are at work, or are preparing to begin work of comprehensive road systems, which eventually will provide excellent means of communication between the principal cities of the state, between the smaller towns and villages and the cities and even from the country and mountain sections to the cities.

It is no gradual development of a road system that the Californians are aiming at; they want the improved highways, and they want them right away, and practically every county is taking advantage of a state law which permits them to issue bonds for highway purposes and appoint highway boards. To a considerable extent the popularity of the motor car on the Pacific coast has been influential in this movement for better roads, but far more powerful has been the realization that by good roads alone can the farmers and fruit growers diminish the cost of transporting their products to market and to the coast shipping points.

San Diego county, the most southerly in the state, is a prominent example of the manner in which Californians are taking up the good roads question. The county is about half the size of the state of Massachusetts, and has practically no roads that would be considered good roads in the Bay state. The highways are of a clayey soil that is extremely dusty in dry weather and becomes almost impassible during the short part of the year when there is rain. This county is on the point of entering upon the construction of 448 miles of highways, and it is this work that will be under the supervision of Mr. Fletcher. He is well pleased with the prospect after having gone over the roads.

According to Mr. Fletcher there is a strip of low-lying land along the coast, but back from the ocean the land rises to rolling country, which is very fertile, and then into the foothills, and finally into the mountains, where the climate is somewhat like New England. There is much fruit growing in the foothills and rolling country, but the people have no way of getting their products to San Diego city except by the freighting teams drawn by six or eight horses or mules that are driven

CHICAGO

To

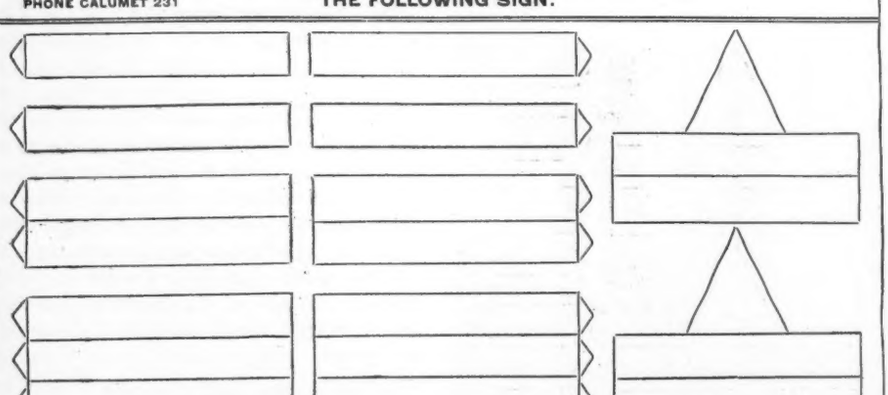
PLEASE DELIVER TO

CHICAGO MOTOR CLUB

SIGN BOARD COMMITTEE

1430 MICHIGAN BOULEVARD

PHONE CALUMET 231 THE FOLLOWING SIGN:



MILEAGE

ROUTE

REMARKS

CHICAGO MOTOR CLUB

PER

CHAIRMAN SIGN BOARD COMMITTEE

ORDER BLANK USED BY CHICAGO MOTOR CLUB IN ORDERING SIGNS

periodically from the outlying districts over the poor roads into San Diego. The persons who operate these freighting teams charge for transportation on a tonnage basis, so that the cost of haulage and the condition of the roads are brought immediately to the attention of the producer.

Some time ago the county of San Diego voted to bond itself to the extent of $1,250,000 to construct a system of roads and chose as a highway board three of its most prominent citizens. They are A. W. Scripps, owner of many newspapers; A. G. Spalding, head of the great sporting goods house bearing his name, and J. D. Spreckels, of the family prominently connected with the sugar industry. This commission selected Mr. Fletcher to do the work and has given him complete charge. The roads now contemplated will take about 3 years to build, and it is confidently anticipated that before the system as now laid out is finished the county will provide the money for several hundred miles additional highways. About 80 per cent of the voters favored the construction of the road system.

Macadam roads, which are so common in New England, probably will not figure extensively in the road system of San Diego county, for there is little need of them, the element of frost which is a most important factor in New England, being absent in that part of California. The main problem is how to build a good road out of the clay and sand that is available, but it is expected that the disintegrated rock of which there are considerable quantities available will prove a most valuable road-building material. If macadam roads are desired there is plenty of rock from which they can be constructed.

The road system, as outlined for San Diego county, contemplates a through trunk road toward Los Angeles, this road to join one constructed by Los Angeles county so as to provide a high-class thoroughfare between these cities. There is also contemplated another trunk road leading from San Diego city southerly to the Mexican border. Other roads will radiate out from San Diego city to the towns and villages of the county and into the rural districts and mountains.

San Diego has one of the best harbors on the Pacific coast, and the inhabitants believe that it has a great future, especially as it is the first United States port north of Panama and will be of immense value to shipping when the canal is completed. It is connected with Los Angeles by the Santa Fe railroad and a new line is being constructed from the Southern Pacific at Yuma, Arizona. With the growing importance of the port the citizens believe that the system of roads that is to be built will place them in a most advantageous position, as it will enable them to get their products quickly and cheaply to a port, from which there will be ready shipment to other Pacific coast points and to the Atlantic ports by way of the canal.

Southerners Hold Big Road Rally

RICHMOND, Va., Dec. 11—The Virginia good roads convention held a 2-day session in Richmond Thursday and Friday. In substance it was decided to hold another meeting here in February, when the legislature is in session. The election of officers resulted as follows: President, Charles T. Lassiter, of Petersburg; vice-president and chairman of the executive committee, Robert W. Withers, of Suffolk; secretary and treasurer, H. L. Harwood, of Richmond; assistant secretary and treasurer and publicity agent, George W. Rogers, of Richmond. Each of the one hundred counties of the state has an honorary vice-president representing the association.

Attention was called to the fact that according to the present law cities are required by charter to use their money in improving their own streets, but the announcement followed that a bill will be offered in the coming legislature allowing them to unite with the counties in building and maintaining roads running into their limits.

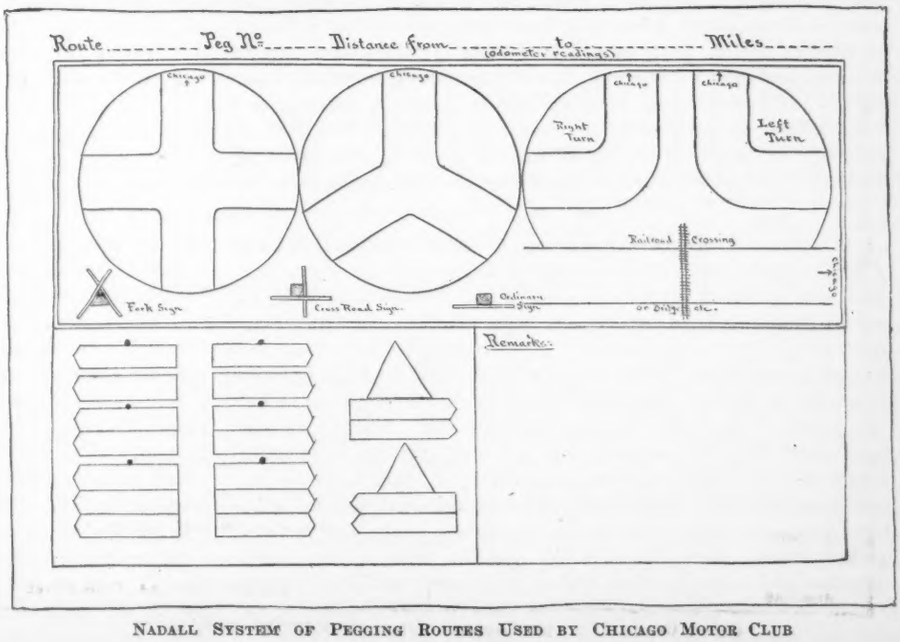
There was no little discussion as to the conflict of authority between representatives of the state highway commission having charge of construction work and the guards having supervision of the forces, some holding that the best results were to be obtained from a common head, while others favored the present method of leaving much detail work to the outpost heads. No action was taken on this.

A resolution was offered and adopted that the legislature provide through the state highway commissioner such heavy road machinery as is necessary for road construction and rent same to the counties using convict labor; that the state acquire necessary quarries to be operated by it and the material sold to counties building state roads at cost, the quarries being bought under direction of the commissioner. A resolution was adopted that the state segregate certain sources of revenue to be perpetually dedicated to the good roads fund, the revenue to be not less than $350,000 annually. Both Governor Swanson and Governor-elect Mann endorsed the plan.

A resolution was adopted that the legislature enact a law allowing counties issuing bonds for good roads to be exempt from county tax and a law providing for the maintenance of state roads to come out of a tax to be levied on motor cars according to horsepower and on other vehicles according to the number of animals required to draw them. The resolution also provides that a larger tax be imposed on narrow-tired vehicles than those with wide tires.

B. E. Rice, of the Virginian railroad, spoke on the willingness of all railroads to aid in road-building and promised such coöperation. He said that the majority if not all of the railroads would be willing to transport road-building machinery for the state at cost.

Senator Charles T. Lassiter, the retiring chairman of the executive committee, made his annual report on the work during the past year. He reported that 15,000 pieces of literature had been mailed in the interest of the work since last February. A feature of the report was the statement that it had been found that it was almost impossible to raise the necessary funds for the continuation of the work of the association through common subscription; that only about 50 per cent of the amount subscribed at the last meeting had been paid and that the association did not have more than 1,100 paid memberships at $1 per year each.



NADALL SYSTEM OF PEGGING ROUTES USED BY CHICAGO MOTOR CLUB

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MOTOR AGE

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The Dictators of the Situation

THE present crisis, namely, the famine of parts, is one more example of the biblical quotation, "The last shall be first, and the first shall be last." Heretofore the car makers have been the arbiters of the field: they have occupied the pedestal of prominence, demanding their deposits at the beginning of the season as well as dictating to the retailer as to how many cars he should receive and when they should be delivered to him; but today it is Dictator Parts Maker and not Dictator Car Maker.

IT takes a big man to occupy a big position prudently and wisely. In a secondary position it is difficult to estimate the real value of many makers but as soon as they get in the lime light, the subtones and the high lights of their real natures appear. Already some of the parts makers are flinching in the spot light of ultra-prosperity. When they could more than supply the demands of the car builders all went well, but now that the tables are turned and they cannot make as many car parts as the builders want their real natures have in some cases had a chance to exhibit themselves. Two or three examples will suffice to show some of the inner workings at the present time. Mr. A, a car builder, has ordered in June his supply of certain parts at $125 each for his 1910 output; Mr. B, car builder, comes along in August and offers Mr. Parts Maker $150 each for the same parts; and in November Mr. C, car builder, offers this same Mr. Parts Maker $225 each for the same part. What is the result? Mr. Parts Maker has sold to all three buyers; he has sold more than he can possibly hope to make with his present facilities and so some one of the three car builders, Messrs. A, B or C, must suffer. In a few cases it is Mr. A who bought at $125 is suffering and is actually being held up due to the unfaithful parts maker who is taking the highest price for his plant's product.

THE presence of such conditions are deplorable. Already they are working evil. Concerns which at the beginning of the season thought they were in good shape as far as 1910 parts are concerned are today discovering that they have not a sufficient number of certain parts to continue their factories according to their present plans. The evil does not stop here, however; their agents had deposited for so many cars at a certain delivery, and they cannot fill these orders. The ramifications of this lack of stability of some of the parts makers could be traced much further. The parts makers should stand by their promises.

AS a result of the present shortage of parts many makers have during the past season installed additional machinery so that they will in future not be so dependent on the parts makers. In several factories huge forges have been added so that drop forgings will not be home products; several factories have installed stamping machinery; in some places machinery for making cross members of frames have been installed and arrangements are being rushed to make the side members also. Many factories have built foundries where their cylinder castings are made; others have aluminum and brass foundries; at other factories the radiators are made; some have forges of sufficient size to make front axles; in a few factories the springs are made; and in fact, makers already have foreseen the possible crisis of the parts situation and have guarded against it by such actions. Today certain car builders who heretofore have bought transmissions and rear axles are now erecting buildings to make their own.

Electric-Car Enterprise

UNPRECEDENTED enterprise is being displayed by many makers of electric cars for next season and although there is not the rush of new concerns into the field such as there is in the gasoline realm there nevertheless is a big opening in the electric business. This is borne out at the present time by the increased outputs of many of the concerns building electrics, but the possible increases of the present factories would prove hopelessly inadequate to the demand were the market cultivated anything like as vigorously as is the gasoline line. The electric opportunity is a big one, but more energy must be put into it to bring it into as favorable light before the motoring public before it will come into that quota of success which it deserves.

UP to the present there has not been that co-operation and competition among makers of electric cars that there should have been. Instead of the different makes entering into competitions scheduled for electrics but one or two concerns have entered, the others refusing to have anything to do with such contests. The only electric demonstrations that have been brought to the attention of the public have been the few occasions when individual makers started across country on long-distance runs averaging 90 or 100 miles per day. These tests, in that they have invariably been made by one concern at a time, have failed to benefit the electric industry as they should have because several of the rival makers have discredited the performances and in some cases affidavits have been made that batteries and motors that were not strictly stock have been made use of, thereby doing much in two ways to destroy the confidence of the buying public in electric cars.

THE electric of today is not a country touring machine but it is a vehicle ideally adapted to city and town uses. In a few private tests that have been made electrics have proven that for making calls in big cities they are quicker than gasoline cars. In crowded streets, owing to their shorter wheelbases, they can be maneuvered more rapidly and with them there is no loss of time in starting the motor after every call. The electric is an ideal vehicle for city use and particularly for women.

RECOGNIZING that it is so valuable for such a field, the electric manufacturers are working an injury to themselves in not getting together and stimulating city contests which would serve to draw the attention of the public to this type of vehicle. The gymkhana is one type of competition which is admirably suited for city purposes and if pushed would result in an amazing amount of additional interest in the electrics. The economy test could be successfully carried out in a city test in which the cost of current for operating electrics so many miles per day within a city for a certain number of days could be computed. With the gasoline car the road race, the track race, the speedway, the hill-climb, the economy test and the reliability all have done wonders to push cars to the front; not so much because of sales as a direct result of this or that car winning but as a result of the renewed interest for the make which was stirred up among the people. The makers of electric cars should get together and arrange for suitable electric tests in the larger cities during the coming summer as well as devising certain fundamental rules that would govern the more intricate points of such tests. The coming year should see makers of electrics try this method of exploitation.

ST LOUIS PLANS TO TAP GREAT SOUTHWEST

System of Motoring Highways Decided On by the Missouri Manufacturers' Association

ST. LOUIS, MO., Dec. 13—Motor enthusiasts of St. Louis have been given great encouragement within the last week in a plan for a system of motor highways from this city to the southwest by action taken by the Missouri Manufacturers' Association. The idea was originated by Colonel Lyman T. Hay, J. A. J. Schulz, L. C. Irvine, E. J. Troy and others equally interested in the improvement of traffic throughout the state for motor cars. At a meeting of the Missouri Manufacturers' Association it was tentatively agreed that surveys should be begun at once with a view of pushing the plans as rapidly as possible.

The scheme provides for a chain of roads to New Orleans and Mobile with St. Louis as the center. These roads would be connected with those of Illinois and Chicago also would thereby be provided with a continuous highway to the southern cities. Two routes from St. Louis through Arkansas are under consideration, one by way of Cape Girardeau, Sikeston and Brinkley to Little Rock and Hot Springs; the other from St. Louis to Poplar Bluff, Mo.; Newport, Ark.; Jonesboro, Ark., Little Rock and Hot Springs. The section from Little Rock to Hot Springs already has been graded by convict labor, and it is the plan to complete that part of the highways through Arkansas by the same means. The extension to the extreme south contemplates the extension into Memphis either from Brinkley or Jonesboro. From Memphis the road would run through Greenville, Greenville or Jackson to New Orleans, with a branch to Birmingham and Mobile.

The Missouri Manufacturers' Association, which has its headquarters in this city, has decided to start a series of path-finding trips at the earliest possible moment. Naturally a certain amount of state legislation will be necessary before the chain of highways could be completed, but this fact will not delay the work in the least. It is known that Governor Hadley will give his assistance to the project, and legislators from various sections of Missouri, as well as bankers and other business men, are being heard from daily on the subject, and all are heartily in favor of the plan.

The Manufacturers' association proposes to start the work in Missouri with a tentative understanding that at least half the expense will be met by St. Louisans. Subscriptions will be taken until this sum is pledged and the state will be asked to stand the remaining half of the expense, except such part as those towns along the route finally selected shall be willing to pay. As to the extension through Arkansas, citizens of the towns in that state to be benefited by the system are urging action as soon as possible. The work in Arkansas will not be nearly so difficult as in Missouri, as the state laws there permit the hiring out of the state penitentiary convicts. Of course, through the other states arrangements will have to be made at the proper time.

The first thing to be considered is the highways through Missouri. Until this feature is assured the local promoters are going to give most of their time to it alone. They will feel they have been well repaid for their efforts even if they get no farther than Little Rock and Hot Springs, but they realize that when once there with a good system of motor highways, or even when once it is seen that those cities are certain to be entered, there will be little difficulty in continuing the system to the southern coast.

In connection with this suggestions have been made contemplating two routes from St. Louis to Chicago, one direct, and the other running from St. Louis to Terre Haute, there to connect with a proposed road from Indianapolis to St. Louis. The Illinois highways have not been worked out to the extent the others have at this end of the line, but persons interested in various parts of that state are being communicated with and something definite is expected to develop soon.

DENVER PLANS A RALLY

Denver, Colo., Dec. 11—The good roads convention which the Denver Motor Club is organizing is making progress and new ideas and suggestions are being received daily by Secretary G. L. Wands from members of the club and persons throughout the state who are interested in the subject of goods roads. One of the latest suggestions was offered by F. W. Carruth, of Fort Morgan, Colo., who has gathered considerable data regarding the new line which the Union Pacific railway is going to put through from Fort Morgan to Denver. This new line will be in a nature of a cut-off and will be put through in as near an air line as possible. In view of the fact that the highway between Denver and Fort Morgan is not a direct one and also on account of the fact that it is very poor because of the great amount of sand encountered, Mr. Carruth proposes that a new highway be made to parellel the Union Pacific cut-off. This would shorten the mileage considerably and would make an excellent road, as there is no sand to be encountered. Another suggestion has been received which is to the effect that the motor club should select one road and spare no pains or expense to make it perfect. With this complete it could be used as an example to interest land owners, farmers and ranchmen, who could be shown just how the work was conducted, how the money was raised and what benefits they would derive from work of this kind on roads in their own vicinity.

If the agricultural resources of Colorado are to be fully developed it is absolutely essential that the rural highways of the state be improved. It naturally follows that the more progressive counties distance the less progressive counties; that the undeveloped sections of the country have a tendency to remain undeveloped, and that in the poorer counties, stagnation and decrease in population takes place. The road laws for the most part do not contemplate the necessity for skilled supervision in road work; hence nine-tenths of the work is done under the direction of men who have no knowledge of road building and who only have a passing interest in it. This is a situation which is truly amazing, for skill is demanded in practically every other line of work. To the trained road-builder it is evident that no more prolific source of waste can be found than in unskilled supervision. Another element which of itself would prove an effective hindrance to efficiency, is that of statute labor, or the method of assessing road taxes in day labor, and of allowing property taxes to be paid in labor. This system provides undisciplined workmen who have no inclination to render an adequate day's service; who have no knowledge whatever of the work, and who frequently are unused to manual labor. In practice it is a matter of common knowledge that working the roads more frequently develops into a pastime than into a real and earnest endeavor to secure good results in the way of good roads.

DECEMBER

17-18—Record trials on the Indianapolis speedway.
25-Jan. 1—Show at Columbus, O.
31—Opening of Grand Central palace show, New York.

JANUARY

7—Closing of Grand Central palace show, New York.
8-15—Madison Square garden show, New York.
17-22—Show of Kansas City Motor Car Trade Association.
17-24—Philadelphia show.
24-29—Show at Portland, Ore.
24-31—Show at Washington, D. C.
24-29—Ninth annual Detroit show.

FEBRUARY.

4-6—Mardi Gras track meet, New Orleans.
5-12—N. A. A. M. show, Chicago Coliseum.
14-19—Show at Hartford, Conn.
14-21—Show at St. Louis, Mo.
14-18—Annual show at Buffalo.
19-26—Show at Newark, N. J.
19-26—Inter-mountain show, Salt Lake City, Utah.
21-26—Show at Binghamton, N. Y.
21-26—Annual Cincinnati show.
22-27—Milwaukee show.
28-March 5—Kansas City Automobile Dealers' Association's show.

MARCH

5-12—Boston show.
21-28—Denver Motor Club show.

E-M-F DECLARES STUDEBAKER CONTRACT VOID

DETROIT, MICH., Dec. 13—The Everitt-Metzger-Flanders Co. last Thursday notified the Studebaker Automobile Co. that all agreements and contracts entered into between the two concerns whereby it was stipulated that the Studebaker company should be the sole distributer of the E-M-F products are rescinded and annulled. The Studebaker reply was received today when its attorneys appeared before Judge Swan, of the United States district court, and applied for an injunction restraining the E.-M.-F. company from annulling the contract. The matter was argued in the chambers. A peremptory order was refused, but a hearing was set for next Monday. The Studebakers claim that the annullment of contract was not authorized by a majority of the E-M-F directors. It developed that the Studebakers sold 4,500 cars, clearing $700,000. The contract was to have run 3 years from August 31, 1909.

The announcement has proven the main topic for discussion in Detroit's trade and the prospect of a prolonged battle in the courts promises to make the event one of which local motordom will hear considerably more before the matter is finally settled.

By an agreement made several months ago, the Studebakers contracted for the entire output of E-M-F cars and the local concern completely abolished its sales department. Immediately prior to the announcement of the change, Clement Studebaker, treasurer of the Studebaker Automobile Co., and Hayden Eames, its sales manager, had purchased the entire holdings in the E-M-F of William E. Metzger, B. F. Everitt and William Kelly, amounting in the aggregate to about one-third of the total stock, the remainder of which remained largely in the hands of Dr. J. B. Book, Charles L. Palms, G. B. Gunderson, W. T. Barbour and Walter E. Flanders, Detroit capitalists. At the time the sales agreement was made it was unanimously the opinion of the stockholders that the arrangement would be one which would redound to the mutual advantage of both the E-M-F and Studebaker companies. The Studebaker interests had purchased one-third of the E-M-F output from the start and the added alliance of the Studebaker interests as stockholders was believed to have ensured perfect co-operation.

Profits Used for Enlargement

The E-M-F company enjoyed a very prosperous season in 1909, manufacturing and marketing in the neighborhood of 8,000 cars. The profits were put into the development of the company's plant and the acquiring of other properties, including the de Luxe factory on Clark avenue, the Western Malleable Co., the Detroit Steel Crankshaft Co., the Monroe Body Co. at Pontiac and the Canadian branch at Walkerville. The de Luxe plant was fitted up for the purposes of manufacturing the Studebaker-Flanders 20-horsepower car and the E-M-F company became the largest employer of labor in the city of Detroit.

Production at the E-M-F plant was proceeding at the rate of sixty cars daily when the news of the rupturing of relations was given out. According to the E-M-F officials this speed will be increased if possible and, on January 1, the Studebaker-Flanders 20 will be coming through in even greater numbers, it is predicted. The company announced some time ago its expectation of building 15,200 E-M-F 30's and 25,000 Studebaker-Flanders in the coming year. The contract with the Studebakers called for only 29,600 cars in all, however.

Charges by E-M-F

The specific instances in which the claim of breach of contract is made by the E-M-F company have not been given. Up to date all inquiries are referred to the data contained in the formal notification which was given in the following letter from President Walter E. Flanders, of the E-M-F, to the Studebaker Automobile Co., under date of last Thursday:

Detroit, Mich., Dec. 9, 1909—Studebaker Automobile Co., South Bend, Ind.—Gentlemen: You are hereby notified that we have elected to and do now treat as rescinded and annulled all contracts and agreements made and entered into between us whereby it was stipulated and agreed that the Studebaker Automobile Co. should act as the sole distributor of the products of this company. Our reasons for so treating such agreements as rescinded and annulled are as follows:

A—Because you have refused and neglected to take and pay for the number of E-M-F 30 cars ordered by you during the months of October and November, 1909.

B—Because of your failure and neglect to give any valid reason or excuse for such non-performance of the agreements on your part, or any assurance that you will in the future perform such agreements according to the terms thereof.

C—Because your actions evince an intention not to perform your contracts and agreements with us, and to be no longer bound thereby.

We believe that some of the causes which have contributed to your failure to perform and carry out the agreements between us, in taking and paying for the number of cars ordered by you are as follows:

First: Instead of establishing a fair and uniform line of discounts to agents you have taken advantage of the tremendous demand for E-M-F 30 and Flanders 20 cars to force dealers to handle this line on discounts that are unfair and unprofitable and which would not compensate them for taking proper care of their customers and maintaining the reputation of our product.

Second: You have also used the popularity of the E-M-F line and dealers' anxiety to handle it, to force the sale of other Studebaker lines of gasoline and electrics for which, independently of E-M-F, there was a very limited demand. In many cases dealers have complained that they were forced to contract for one or more such cars in order to get the agency for E-M-F 30 and Flanders 20. Many first-class dealers refused to be so coerced and, therefore, we are not properly represented in many localities.

Third: In our opinion it was a very grievous commercial blunder for you to recently announce through the public prints that there would be no 1910 model of the E-M-F 30 car manufactured by this company. You knew at that time that we had brought out a new model differing in several important features from its predecessor; notably, a new form of front axle, improved spring suspension, improved design of body and a clutch of different type from that which had been used formerly, also a general refinement of details.

Fourth: You have, through your advertisements, misled the public into the belief that Studebaker owned a controlling interest in this company, thereby confusing agents and buyers and injuring the reputation of the product, as we believe, in many localities. The fact that some of the Studebakers are minority stockholders in this corporation has given you first consideration in the sale of our product, but as Detroit capitalists furnished all the money that has actually been used in the formation and operation of this company, they have too much at stake to risk their investments and the investments of other stockholders, on a sales policy, which experience has demonstrated, does not fit in with the manufacturing program laid out, by your assent, for the production of 29,600 motor cars for the year beginning September 1, 1909.

To insure permanency in a business of this magnitude it is of the utmost importance that liberal treatment be accorded dealers and buyers of motor cars in order to create confidence and develop new business.

Therefore, commencing December 9, 1909, we will sell, independently of Studebaker, the E-M-F 30 and the Flanders 20 motor cars manufactured by us. We will enter into negotiations immediately for the sale of our product from branch houses or through dealers or agents whom we will select in the United States, Canada and foreign countries, provided such dealers are free to accept the selling proposition we have to offer them. Yours truly, Everitt-Metzger-Flanders Co., W. E. Flanders, President and General Manager.

Immediately following the publication of this notification, Clement Studebaker and Hayden Eames, of the Studebaker interests, appeared in Detroit, with John S. Miller, of Chicago, chief counsel of the Studebaker interests. The announcement was made that the South Bend people denied flatly the allegation that the Studebakers had been guilty of any breach of contract. Attorney Miller says the Studebakers have taken all the cars called for in their contract and have gone to great expense in the exploiting of the E-M-F cars and in the establishing of a big chain of agents all over the country. He also claimed that the E-M-F interests were actually indebted to the Studebakers for a large sum.

Otto Kirchner and General Henry M. Duffield, of the Detroit bar, also were retained to assist in the court procedure which seemed imminent.

Studebaker Will Fight

"The Studebaker company is determined to resist the claims of the E-M-F company by all legal means available," said Mr. Kirchner, "and will insist on the strict performance of the contract. It will protect the interests of its agents and customers throughout the country, regardless of cost."

Members of the local trade have gossipped freely over the move of the E-M-F. General rumor has it that the difficulty has arisen over the alleged failure of the Studebakers to keep the sales end of the business up to the rather unexpected development of the manufacturing end. President Walter E. Flanders' tremendous energy is well known locally. As factory manager of the Ford he was the man directly responsible for the production of 10,000 cars in one season, this being the first time that production ever attained such magnitude in any motor car factory in the world. That Flanders produced cars faster than the Studebaker interests could dispose of them under their plan of placing agencies is the generally credited solution of the difficulty.

The change also is believed to shed some light on the withdrawal several months ago of William E. Metzger, Bernard F. Everitt and William Kelly from the E-M-F. Everitt was the original E-M-F president, Metzger the secretary and Kelly the designer of the car. The three are believed to have sold their interests on account of friction on the E-M-F board of directors, over the sales agreement then in prospect with the Studebakers, retiring to form the Metzger Motor Car Co., one of the leading members of the 1910 factories. That Metzger, Everitt and Kelly saw further than the other members of the board of directors is now being generally believed.

New E-M-F Sales Arrangement

The E-M-F followed the announcement of a new sales arrangement by immediately starting an organization. Pending the appointment of a sales manager, Advertising Manager E. Leroy Pelletier took charge. The sundering of relations had been heralded in an advertisement telegraphed widely over the country and stating flatly that the E-M-F was in search of new distributors. Wherever former representatives are free to assume the E-M-F line these are to be extended the first chance. In lieu of formal announcement it is understood locally that the representation will not be limited to one dealer in each city but that the cars will be sold to as many as desire to handle the line. This was the E-M-F policy before the Studebaker contract.

Pelletier's connection with the break is a source of interest to a large circle of Detroit friends. He was instrumental in the formation of the E-M-F company and left his position as advertising manager of another concern to handle the publicity of the new company. When the Studebakers secured the entire E-M-F output he was given nominal headquarters in South Bend, from which he handled the publicity of the Studebakers' combined lines. He never relinquished his residence in Detroit, however, and at once took up the work of reorganizing the firm's selling force.

OLDFIELD SMASHES RECORD

Dallas, Tex., Dec. 12—Bundled in woolen bandages, and wearing a great fur overcoat and gloves, Barney Oldfield drove his 120-horsepower Benz in the teeth of a gale yesterday afternoon at the fair ground track and easily broke the 50-mile circular track record which has stood for several years, and he got inside his former record made at Fresno, Cal., by 1 minute 22 seconds, the new figure being 47:18⅘ against the old 50-mile world's record on a circular track at Fresno, Cal., of 48:40⅘. Oldfield by skillful driving got inside the previous record for 30 miles. The radiator of his car was filled with alcohol as the one sure preventive against freezing, and his driving was most spectacular over a frozen track. Owing to the intense cold at the finish of the drive Barney's hands were so affected that they were almost frozen to the wheel and had to be pulled loose. In making the record Oldfield also smashed the Dallas track record for 30 miles in 28:55 against Burman's mark of 30 minutes for the distance. Two miles only out of the fifty required more than 1 minute, these being the thirteenth and thirty-first laps, the time for each of these circuits being 1:00⅘.

Studebakers File Answer To the E-M-F Statement

South Bend, Ind., Dec. 13—Through John S. Miller, its leading counsel, the Studebaker company has issued the following letter on the E-M-F situation as its side of the case:

"In August, 1908, the Studebaker Automobile Co. became selling agent and undertook the exploiting and selling of this car under a contract with the manufacturer—the Everitt-Metzger-Flanders Co. This agency was exclusive except as to certain territory. From September, 1909, it covered the entire product and gave to the Studebakers the exclusive sale in all territories, American and foreign.

"At the time this contract was made none of these cars had been sold. Some of the men interested and active in the management of the Studebaker company acquired and held over 36 per cent of the stock of the E-M-F company, and the Studebakers gave to the handling and sale of the cars the benefit of the extensive facilities of its great organization and name and established nearly a thousand agencies throughout the country to handle this business, and have successfully promoted the sales of the cars until the manufacturers have found it requisite to make enormous extensions of their manufacturing plant.

"On last Friday the Studebaker company unexpectedly received by mail a letter declaring that the contract would be annulled. This fact was announced in the Detroit press before the letter was received by the Studebakers. On the following day a full page advertisement to the trade and public, setting forth this letter and an invitation to deal direct with the E-M-F company, appeared in a Detroit newspaper.

"The Studebaker company wishes it to be understood it has faithfully kept in full the obligations of its selling contract, and this attempt to repudiate it is without any just cause in fact or in law. The contract, accordingly, is still in full force, and the Studebakers propose to see that this contract is carried out and that its trade and its organization and investment in the successful promotion of the sales of these cars and the fruits thereof be not thus taken away from it or its agents, and to take prompt and vigorous steps for its own protection and that of its agencies and trade."

The curtain raiser for the afternoon was a 5-mile handicap, the entries being Kirschner in his Darracq, Shaw in a Knox Giant, Joe Girard with the Velie. Kirchner overcoming a 50-second handicap won the event in slow time, 5:24. In the 5-mile Oldfield-Kirschner match, best two heats out of three, Oldfield won two in succession in 5:11 and 5:17 respectively. The racing was tame, neither driver going the limit at any time.

Four cars entered the race for the city championship—J. Girard, Velie; Spencer, Hupsmobile; George Clark, American; Ed Sluder, Maxwell. The Velie and American were handicapped 1 mile in 5. Girard won in 6:11. Neither Shaw nor Girard put up any fast driving in the 5-mile race. Shaw won in 6:28⅘. Two records are held on the Dallas track.

SAMPSON COMPANY TO CONTINUE

New York, Dec. 13—When the late Alden Sampson died at his post of duty, at Pittsfield, Mass., and was laid to rest in the family vault on Sunday, December 5, the motor world lost an ideal pioneer, one of its most accomplished engineers, and a pillar for stability. It will come as no surprise to those who enjoyed the confidence of the late head of this pioneer company that it is to go on, for the expressed wish of the late Alden Sampson was that not a moment should be lost; not a thing should be changed; not a single effort should be made which would even tend to hamper the efforts of the company of which he was president. The policy of the company of not permitting its trucks to go into any service to which they were not well fitted will be continued. G. E. Mitchell, long associated with the company, is at the helm and will carry out the policy of the late Mr. Sampson.

ANOTHER DETROIT CONCERN

Detroit, Mich., Dec. 13—Articles of incorporation for the Detroit Body Co. have been filed, the stockholders being exactly the same as those of the Sibley Lumber Co., one of the largest local dealers. Factory room has been secured at Kercheval avenue and the railroad tracks and Frank J. Moham, formerly expert body builder for the Packard Motor Car Co., has been secured to act as superintendent. The officers of the company are as follows: Frederick M. Sibley, president; F. M. Sibley, Jr., vice-president and treasurer; Harry H. Berger, secretary. The firm announces that it will be ready to make its first deliveries January 1.

FORD FILES AN APPEAL

Detroit, Mich., Dec. 14—Rumors to the effect that the Ford Motor Co. intends to drop its fight against the Selden patent and join the Association of Licensed Automobile Manufacturers are stamped by Henry Ford himself as absolutely false. He declares he will fight the case to the limit, notice of appeal already having been filed.

Prepare For Speedway Meet

INDIANAPOLIS, Ind., Dec. 13—Reasonably fair weather is all that the management of the motor speedway is asking for the race meet which is scheduled for Friday and Saturday of this week. The brick course has been completed, with the exception of the laying of a single brick. The laying of the last brick is to be more or less of an elaborate ceremony at the opening of the meet Friday. The brick is gold-plated and is valued at $500. Officials of the speedway will lay this brick at the finish line just before the first car starts in the first event Friday afternoon. Ernest A. Moross, director of contests, is still working on the program. He states that to today there have been fifteen entries, as follows: National Motor Vehicle Co., five cars, with Aitken and Kincaid as drivers; Nordyke & Marmon Co., three cars, with Harroun and Stillman as drivers; Empire Motor Car Co., three cars; Cole Motor Car Co., two cars; Fiat, Lewis Strang driver; Christie, Walter Christie, driver, and one car by the American Motor Car Co. There are to be speed trials for all classes with flying and standing starts. No more than three cars of one make will be allowed in any one event. It is expected that the entry list will grow considerably before Friday. There will be 1 kilometer, ½ and 1-mile speed trials. There also will be longer events for cars of all classes coming under the rules of the A. A. A. The speedway management has arranged the admission fees at nominal figures, not anticipating that the coming meet will be a large success financially. It is the hope of the management of the speedway to have the Indianapolis course hold all of the records at the close of this year.

SPEEDWAY'S $500 GOLD BRICK

ST. LOUIS TRAFFIC RULES

St. Louis, Mo., Dec. 13—A bill drafted by the St. Louis Automobile Club has been introduced in the city council at St. Louis, Mo., by Councilman Norvell, and there is every assurance it will pass both that body and the house. The proposed ordinance has the sanction of the Manufacturers and Dealers' Association and all other organizations of the city which are interested in the traffic problem; also it has been approved by the mayor and the chief of police. Chief among the features of the bill are that all vehicles, whether horse-drawn or driven by motor power, must turn to the right upon passing others proceeding in the opposite direction, slow-moving rigs being required to keep close to the curb, while motor cars and carriages are allowed to remain near the center of the street. All vehicles brought to a stand at the curb must, according to the bill, face in the direction of the traffic, and make a full turn in finding its desired stopping place, if this be on the opposite side of the street. No fixed speed limit is provided in the bill other than a "reasonable limit," and this is left mainly to the police, whose duty it is to see that the ordinances regulating traffic are complied with. A fixed penalty of from $10 to $100 is provided for the failure of any person driving either a motor car or a horse-drawn vehicle to stop when commanded to do so by an officer of the law.

BIG BODY PLANT FIRE

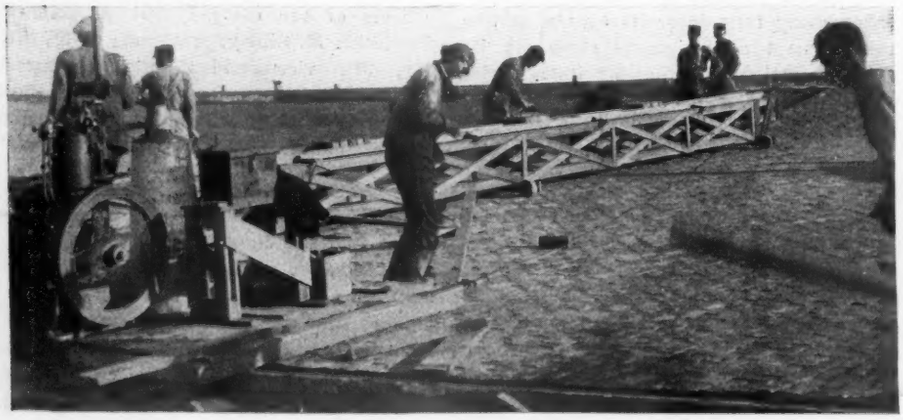
Racine, Wis., Dec. 14—The entire plant of the Racine Mfg. Co., one of the largest builders of motor car bodies, tops, dashes, etc., in the world, was destroyed by fire Sunday morning. The loss is about $600,000, with insurance barely half of this amount. Other losses aggregating about $75,000 were caused by the fire. The fire was discovered at 3 o'clock Sunday morning, just as the worst snowstorm of the winter was raging. When the firemen arrived, the water pressure was found below standard, while two of the nearest hydrants were frozen. Milwaukee and Kenosha were called upon for aid, but when the emergency apparatus from these cities arrived the plant was in ruins and attention was given to saving surrounding buildings. The circumstances make the loss a greater blow than usually, because the company only recently had completed several large new buildings. More than 1,200 workmen will be out of employment. Several thousand tops and bodies were destroyed. Only last week orders had been received for almost 75,000 bodies. All patterns were destroyed. Frederick Blandin is president and George Jagers secretary, treasurer and manager of the company, which in the time of 6 years has grown from a small novelty works into undoubtedly the largest motor car body plant in America. The buildings destroyed were: Main factory, six stories, brick, 208 by 72 feet; office, four stories, 60 by 77 feet; two four-story frame buildings, 40 by 120 and 44 by 120 feet; two four-story brick structures, 380 feet long and extending from Sixth to Eighth streets. The plant will be rebuilt at once. The Mitchell company will not suffer any setback from the fire because it has a big stock of bodies in its warehouse, which will meet its demands until the Racine plant is once more in operation.

STEARNS WINS 6-HOUR RACE

Los Angeles, Cal., Dec. 12—In the 6-hour race at Ascot park today, which was marred by numerous accidents to cars and serious injuries to two participants, the Stearns, driven by Soules, won, the distance made being 293 miles. The Pullman, driven by George Kussman, was second, with 251 miles, and the Buick third, with 249 miles. The Buick led until the sixth hour, when it broke down. A record of 54 miles for 1 hour and 105 for 2 hours was made and the 3-hour mark, 15.2 miles, equalled. In the fifty-second mile the Apperson Jackrabbit, Harris Hanshue at the wheel, turned over three times on a sharp turn. Neither Hanshue nor his mechanician was injured. The Cadillac overturned at the same spot a few minutes later. The mechanician was slightly injured. The Sunset was the next to go over.

BOOSTING THEIR OBJECT

San Francisco, Cal., Dec. 9—Another trade organization has been added to San Francisco's list. This is the Motor Trade Association, which is the outgrowth of a luncheon club formed in this city several weeks ago by a number of the leading motor car men of the city. In view of the moribund condition of the Automobile Dealers' Association of Northern California, the future of the new organization will be watched with interest. The members of the Motor Trade Association declare, however, that they are not seeking to displace the Dealers' Association, but that they are entering the field in a spirit



WORKMEN LAYING BRICK SURFACE ON INDIANAPOLIS SPEEDWAY

of general boosting. Talking of the aims of the new association one of the members said: "Our organization is by no means to be considered as an opponent of the present Automobile Dealers' Association of northern California. We would be glad to have the co-operation of that association in anything that we may undertake. But there are from time to time questions arising in the business that seem to require some concerted line of action among the motor car men, and the new association will remain virile and ready at all times to deal with the problems that come up for discussion.

At a meeting held on Tuesday Irving J. Morse, manager of the western branch of the Locomobile Co. of America, was elected president of the new association. Harry L. Owesney, manager of the California branch of the Winton Motor Carriage Co., was elected vice-president, and C. S. Richardson, agent for the Knox, was chosen secretary-treasurer. Among the other members are Rene J. Marx, western representative of Renault; A. J. Smith, representing the Elmore in northern California; S. G. Chapman, agent of the Oakland and the Hupmobile; W. F. Culberson, manager of the Pierce-Arrow Sales Co., and H. B. Rector, of the same firm; H. L. Pelton, local representative of the Columbia; H. D. McCoy, of the accessory firm of Chanslor & Lyon, and Benjamin H. Pratt, the new Pacific coast representative of the Fisk Rubber Co., of Chicopee Falls.

CHANGE RENEWAL CLAUSE

Boston, Mass., Dec. 13—The expected has happened in Boston as a result of the Massachusetts highway commission sending out its application blanks for renewals of licenses to operate motor cars in the Bay State. On one side of the blank was a space filled with three certificates relative to the character of the motorist applying for a license. Nothing was said about any distinction between professional and private operators as it applied to all and naturally when some of the men who have been operating cars in Massachusetts for several years got their blanks they were angry and indignant. For instance, such men as President Lewis R. Speare, of the A. A. A., and Colonel William D. Sohier, who is one of the members of the highway commission; Eliot C. Lee, ex-president of the A. A. A., and even Governor Eben F. Draper himself, if he undertook to drive his own cars, were supposed to have three people of good character endorse them as being desirable citizens and worthy of the honor to pay $2 into the state treasury for the privilege. Before the motorists could get together to voice their sentiments and throw verbal bombshells at the highway commission the rule was changed. Now the men who have had private licenses heretofore and apply for renewals do not have to get the endorsement of friends. However, the chauffeur must get the certificates filled out, no matter how long he has been driving.

Simplex Wins Fort Lee Hill Honors

NATIONAL SKIDS AT CORNER

NEW YORK, Dec. 11—On agreement to make no public announcement of its intention to complete the hill-climb that was begun last Saturday, the Motor Contest Association was yesterday allowed to finish its program on the Edgewater-Fort Lee hill. The affair was necessarily postponed a week ago because of the congestion of traffic, as well as the crowding of spectators on the grade. Yesterday there were barely 200 spectators, and with a few breaks for the passage of traffic the various events were decided without particular incident or danger.

In event No. 4 the Grout and Stoddard-Dayton competed, but neither was able to better the time of :57 57-100 made by Kincaid's National on Saturday. The Stoddard-Dayton, however, made 1:07 3-5, thus taking second place, pushing Hurmance's National, 1:08 97-100, back to third. This was the only unfinished contest of the first day.

George Robertson in the Simplex car was the star. He negotiated the 3,000-foot grade with the two bad turns in the remarkably good time of 53 2-5 seconds in the class 6 event, for cars selling at $4,000 or over. His next win was in the No. 9 class for stock cars of 451 to 600 cubic feet displacement, and he made the ascent in 56 seconds.

Harvey Bellin, driving a Stanley steamer in the free-for-all, made the next best time of the day, covering the course in :54, while Tom Kincaid in a National was second in this class with a time record of :55. Event No. 7 was won by one of the new models of Oldsmobile cars. This event was open to gasoline cars selling at $3,000.

With the exception of a Stanley car, all five in the free-for-all climbed the hill in less than a minute. V. P. Pisini, in a Zust car, won in the class for cars of 301 to 450 cubic inches displacement. The Zust car also won the amateur event in :56 3-5. The meet was a success in every way. Summaries:

FOUR-CYLINDER CARS, $4,000 OR OVER

Car and H. P.	Driver	Time
Simplex 90	Robertson	:53 2-5
Stearns 30-60	Badenhauser	:58 2-5
Stearns 30-60	Powers	:59 4-5
Allen-Kingston	White	*
Simplex	Heitmoyer	*

SIX-CYLINDER CARS, $3,000 OR OVER

Oldsmobile 60	Spear	1:14 3-5
Stearns	Howard	*

FREE-FOR-ALL, ALL TYPES AND MOTIVE POWER

Stanley steamer 20	Bell	:54 1-5
National 40	Kincaid	:55
Stanley steamer 20	Faulhaber	:58 3-5
Simplex	Heitmeyer	*
Stanley	Bellows	*

STOCK CHASSIS, 451 TO 600 INCHES DISPLACEMENT

Simplex 50	Robertson	:56
Simplex 50	Heitmeyer	1:00
Locomobile 40	Whitcomb	1:04 4-5

STOCK CHASSIS, 301 TO 450 INCHES DISPLACEMENT

Zust 35	Pisani	:57 2-5
National 35	Hurmance	1:02

AMATEURS—CLASS A, UP TO $2,000; CLASS B, ABOVE $2,000

A—Stanley steamer 20	Faulhaber	:57
A—Buick	Dr. Nafis	1:04
B—Zust 35	J. Derigne	:56 3-5
B—Stearns	Badenhauser	1:00
B—Simplex	Heitmeyer	1:01
Allen-Kingston	F. R. White	*
Locomobile	R. Whitcomb	*
Stoddard-Dayton	R. V. Morris	*

COMMERCIAL VEHICLES, UP TO 1 TON CAPACITY

Simmons 20	Reitkowski	2:58 1-5

* Did not finish.

SMALL BLAZE IN MILWAUKEE

Milwaukee, Wis., Dec. 14—The Hickman-Lauson-Diener Co., 222-226 Third street, Milwaukee, Wis., agent for the Ford and Cartercar, sustained a loss of about $2,000 as the result of a fire in the Schlitz Brewing Co.'s building on Sunday evening. There were eighteen cars in the H-L-D garage, three of which were removed and fifteen others protected by the insurance patrol. The fire originated in the boiler room of the Western Novelty Co. on the third floor.

ROBERTSON IN SIMPLEX FORT LEE CLIMB STAR

SKETCH SHOWING GRAND CENTRAL PALACE INTERIOR

Preparing Palace For the Show

NEW YORK, Dec. 13—Work was started this week on the interior decorations of the Grand Central palace for the show which opens on New Year's, under the management of the American Motor Car Manufacturers' Association. The official decorators started a force of 125 artisans at work on the trellis garden decorative effect which will be used for the first time in a New York show, and while the same idea has been used in other parts of the country, nothing so elaborate in this line ever has been planned or executed before. Heretofore it has not been possible for the decorators to get into the palace so far in advance of the show, but this year all work will be completed before the private view at 3 o'clock on Friday, December 31.

The work of transfiuring the first gallery has already been begun and as soon as this is completed the artists and carpenters will start work on the second gallery and will then give their attention to the main exhibition hall. Special attention will be given this year to the ceiling under the two balconies, which heretofore have not been given much attention by the decorators.

Outside of the trellis garden idea, the decorative scheme involves a lattice and landscape effect, with the whole set forth by tens of thousands of glittering lights and huge chandeliers of electric balls of fire which will throw the pictorial scenes and the cars themselves into high relief. One of the most spectacular features of the decorative scheme will be a huge electrical marble fountain stationed at the end of the main hall where last year's statue was erected. The base of this fountain will measure 16 feet and it will be over 14 feet in height. Back of the fountain will be an immense plate glass mirror and surrounding the two will be a beautiful peristyle of green trellis work 40 feet in length by 25 feet in width. At the base of the fountain and surrounding the peristyle will be planted low growing trees, shrubbery, potted plants and flowers. The fountain itself, which involves some cunning mechanical ideas, will be operated by a rotary pump and the eletrical effects will be produced by a combination of colored mirrors and electricity which it is expected will excel anything of its kind ever seen in this country.

Another striking effect which will greet the vistors even before they enter the building will be a beautiful porte cochere of green trellis work and frosted glass, which will be illuminated at night by hundreds of parti-colored electric lights, and the whole surmounted by a reproduction of "Miss Liberty at the Wheel," which is also outlined in electric lights.

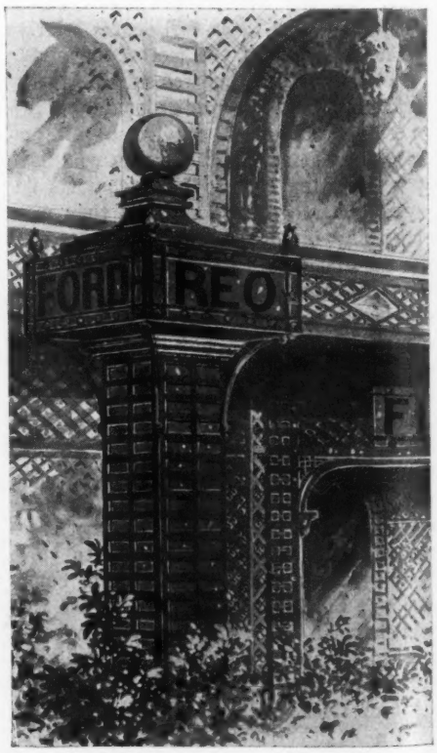
Briefly, the color scheme and decorative effect for this year's show will be nile green lattice work on a soft caen stone background, while the roof will simulate a large trellis arbor hung with grapevines, through which the blue sky is faintly seen, and the whole is softly illuminated by scores of immense electric alabaster globes of light, which are hung by chains from the roof of the arbor. The floor covering, which will also be of a soft green tone, is composed of a specially woven fabric, while specially designed garden furniture of the early English period will be used in all of the booths and will harmonize with the whole general color scheme.

The signs, too, have been specially designed and the names of the various exhibitors will appear in raised gilt Egyptian letters on a green ground, surrounded by the usual lattice framework. This idea will be followed all through the main floor and the two upper galleries, except in the central court on the main exhibition floor where trellis standards surmounted by illuminated alabaster signs will be employed.

The trellis garden scheme will also be employed on the first and second galleries with the arbor idea carried along the side walls, combined with a terraced garden effect on the west walls of the building. Here soft-toned panels of formal gardens interspersed with lattice work will lend an air of breadth and spaciousness to the whole building.

MOLINE WINNER IN TEXAS

Fort Worth, Tex., Dec. 10—Winners in the Star-Telegram 6-day endurance run were announced yesterday by the technical committee after the completion of the examination of the competing cars. It was announced that the Moline, driven by J. A. Wicke, had captured the endurance cup with a score of 991.5. The Auburn, driven by Skeet Hall, was given the economy cup, while the tire trophy was awarded to the Fisk, which put through one of

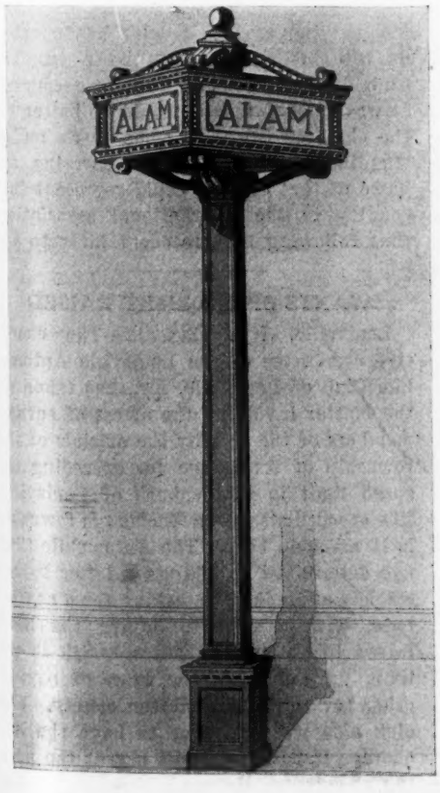


STYLE OF PALACE SHOW SIGN

its three sets without puncture or other trouble. The report of the technical committee showed that only 7½ hours' labor and new material costing $17.55 would be necessary to place all of the cars examined in good operating condition again. Undoubtedly this reliability run was one of the most severe in the history of motoring in the southwest. The weather conditions were against it nearly every one of the 6 days and the surviving drivers tell many a story of hardship and adventure. The route covered 560 miles and the severity of the conditions encountered may be best realized when it is stated that on 1 day it required 11 hours to cover 45 miles. The tour started from Dallas and went to San Angelo and return. The cars that started included the Maxwell, driven by Jess Illingworth; Jackson, driven by George Clark; an Overland, driven by Turken Koph; J. A. Wickes' Moline; T. B. Funk's Overland; B. M. Childress' Brush; Charles Goldthwaite's Marmon; A. Chandler's De Tamble, and Skeet Hall's Auburn. A Cole, driven by H. E. Crowley, acted as pilot car, while the run was managed by Carl Crow, motor editor of the Fort Worth Star-Telegram.

MAKING IT 6-DAY SHOW

Milwaukee, Wis., Dec. 14—The second annual show of the Milwaukee Automobile Club, to be held in the new Auditorium, State, Cedar, Fifth and Sixth streets, from February 22 to 27, will be a 6-day exposition, including two holidays. The show will open on Washington's birthday and remain open until 11 o'clock Sunday night following. Space is selling rapidly.



MADISON SQUARE GARDEN SHOW SIGN

PORTE COCHERE DESIGN FOR PALACE SHOW

Lowell Club Plans For Next Year

LOWELL, Mass., Dec. 11—President J. O. Heinze, of the Lowell Automobile Club, has just returned from a visit to the west and one of the first things he said on reaching home was that it was very probable that there would be some more big races here next September. When the last races were over it was said that there was a deficit of some $10,000. This never has been denied or affirmed, but as nothing definite has been made public it is very likely that the loss was not as great as that. According to President Heinze the motor car manufacturers have taken it for granted that Lowell will promote another big race meet, and he was promised entries.

Next year it is not likely that the Lowell club will undertake to run off a carnival covering a whole week. That was where the money was lost last fall. The marathon race and the motor cycle events cost a lot, but they brought in practically nothing. So the program will be 2 days of racing, or maybe just 1 day after the fashion of the events at Long Island when the Vanderbilt is run. The date, of course, will be Labor day. Senator Hibbard, chairman of the roads and bridges committee of the legislature, has been elected again from Lowell and no doubt he will take a hand in the granting of the necessary permit to run the race. That there may be some opposition again is likely. However, this may be smoothed over. The only thing that may come up on the part of the officials granting the sanction is the question whether Lowell will get a national event or simply a local one like Philadelphia. There is some talk now of trying to clinch the Vanderbilt race for Lowell for that date, or to have Mr. Glidden put up his trophy for the big racing event now that it has been handed back to him. As he comes from Lowell, that would be a feasible plan.

NEW SAVANNAH COURSE

Savannah, Ga., Dec. 12—Savannahians feel so confident now of having another grand prize race or one on that order that the convicts are being put to work to put the course in better condition. If another big race is held a new course will be found here. Instead of having twenty-odd turns only seven are now to be found. The lengthening of Ferguson avenue straightaway to LaRoache avenue offers a 5-mile stretch. This also allows the worst turns of the old course at Isle of Hope to be done away with. The loops around the county farm will be eliminated and some of the curves in Whitefield avenue will be cut out, making this practically a straightaway and an even more radical change than any other, leaving out the White Bluff road and using Waters road instead. With White Bluff road left out it will do away with one of the most picturesque parts of the course, but will offer a much faster course. The change will shorten the course from 25 miles to 18 or 20 miles.

FRENCH OFFICIALLY TEST OIL CONSUMPTION

PARIS, Dec. 5—Speed, reliability and simplicity are features that have been very closely studied in the modern motor car, but comparatively little attention has been paid to economy. This is doubtless due to the fact that the greatest development of the motor car has been as a pleasure vehicle, the owner of which, although keen to get the greatest value for his initial outlay, pays little attention to the daily and comparatively small expenditure for gasoline and lubricating oil. There are not many owner-drivers who can state offhand the mileage per gallon of their cars, and still fewer who know exactly how many miles they can run with a pint of lubricating oil. It is only necessary to see the pools of oil left by most cars after standing a few minutes to realize that the owners and manufacturers are often as careless as they are ignorant on this point.

Even in Europe, where the high rates of gasoline and greater price of lubricating oil, compared with the United States, leads to greater economy in their use, the matter has not received anything like adequate attention. It is only since the development of the motor car for commercial purposes that manufacturers have been obliged to see that the appetite of their engines was not too great and that the ability of using up or loosing lubricating oil was kept within bounds.

Saving in Lubrication

Undoubtedly the modern car, with its well-designed carbureter, is much more economical than those of a few years ago. Modern methods of construction, too, have diminished the loss of oil through leakage. Lubrication methods, however, are far from being perfect, as can be judged from the official results in the recent French commercial vehicle trials. For the first time in any competition an accurate control was maintained on oil and grease as well as on the various fuels used. The test really was a practical one, for it was spread over a period of 30 days and for a road distance varying from 1,500 to over 2,000 miles.

The small number of entries makes it impossible to draw any general conclusions except in one class, which was devoted to trucks carrying a useful load of between 2 and 3 tons. Without entering too closely into figures, it may be stated that the actual load, exclusive of tools and spares, was in every case only a few pounds short of 3 tons. The vehicles made twenty-four journeys, over various kinds of roads, and under varying weather conditions, the total distance covered being 1,794½ miles. Altogether they were under control for 30 days, there being 6 days devoted to exhibitions.

The best performance was made by a four-cylinder Saurer, which during the month consumed 37.7 pints of lubricating oil and 2 pints of grease. This means that

FRENCH OIL CONSUMPTION

Car—	No. Cyl.	Bore and stroke	Total miles	Oil, in pints	Miles per pints
Saurer....	4	4.3x5.5	1,794.5	37.7	47.8
Saurer....	4	4.3x5.5	1,794.5	52.8	34
De Dion...	4	3.5x3.9	1,794.5	70.4	25.4
Vinot.....	4	4 x5.5	1,794.5	107.2	16.7
Aries.....	4	3.3x4.3	1,794.5	132	13.5
Delahaye..	2	3.9x7.08	1,794.5	135.5	13.3
Delahaye..	2	3.9x7.08	1,794.5	139	12.9
Peugeot...	4	3.5x4.7	1,794.5	140.8	12.7
Vinot.....	4	4 x5.5	1,794.5	149.6	11.9
Aries.....	4	3.3x4.3	1,794.5	161.9	11.08
Panhard...	4	3.5x5.1	1,794.5	241.2	7.4
Malicet....	4	3.5x4.7	1,794.5	260.5	6.8
Cohandet..	2	5.7x5.7	1,794.5	602.18	2.9

47.8 miles were covered for each pint of lubricating oil. In the official table the grease consumption is, curiously, given in pints instead of in pounds. This item, however, can be ignored, for in every case but one the consumption did not exceed 3 pints for 1,794 miles. Oil generally was employed in gear boxes, grease only being used for universal joints, steering gear and connections, etc.

Thirteen Vehicles Tested

Thirteen vehicles are included in the official table, these having gone through the month's trial with a clean score so far as regularity is concerned. The average oil consumption was at the rate of 1 pint per 16.4 miles. The Saurer, which held the record with 47.8 miles on a pint, and incidentally won first prize for all-round economy and efficiency, was followed by a duplicate vehicle with 34 miles to a pint. A de Dion also was very economical with 25.4 miles to a pint of oil. A two-cylinder Delahaye, which obtained second prize on formula, running the Saurer very close, evidently lost first prize entirely to the neglect of economy in lubricating oil. It was the most economical in fuel, whether it was gasoline, alcohol or benzol, but it required a pint of lubricating oil every 12.9 miles.

The value of the test is shown by the fact that whenever there are two similar vehicles from one factory their oil consumption practically was the same, thus showing that it was a test of systems, and not a mere exhibition of the ability of the driver to skilfully economize without risk to his motor and transmission. The test also proved conclusively that constructors had not paid sufficient attention to economical lubrication, otherwise we should not see differences of over 100 per cent under identical conditions of operation.

The accompanying table sets forth the amount of oil consumed for a total distance of 1,794.5 miles and gives the mileage obtained on a pint of lubricating oil. The vehicles were run at an average speed

of not less than 9 nor more than 15½ miles an hour. In all cases, and in order to be prepared for emergencies, the drivers kept as near as possible to the maximum average speed allowed, sometimes traveling on the open road from 20 to 24 miles an hour without apparent effort. Great interest was displayed in the test and the results of the oil test ought to be especially interesting to motorists not only of Europe but the United States as well. One good point is that results are official.

INTERNATIONAL BODY MEETS

New York, Dec. 11—A cablegram to the New York Herald from Paris tells of the action of the International Association of Recognized Automobile Clubs which held its annual session this week. On the question of unification of motoring triptychs, it was agreed that delegates from each country should approach the customs authorities of their respective nations to ascertain to what extent they were favorable and would help in the creation of an international triptych, or international circulation ticket. The results of these negotiations are to reach the headquarters of the association before February 1 next, when a further meeting will be held, with a view to the elaboration of the international document. The association further decided that all motoring speed records for distances under 5 miles must in future be taken by means of a mechanical apparatus of a type approved by the association. An application for membership to the international association was made by the Automobile Club of Brazil, with headquarters at Rio de Janeiro, and the Automobile Club of Sao Paulo, in the same country. It was decided that it would be better for the clubs of Brazil to come to an understanding so that the club carrying the name of that country could represent that country in the international association, thus following the precedent hitherto set.

WANTS SPEED LIMIT RAISED

Louisville, Ky., Dec. 12—The executive committee of the Louisville Automobile Club of Louisville, Ky., has taken up the matter involving the arrest of several members of the club by the officials of the township of Anchorage for exceeding the speed limit in that suburb of Louisville. The speed limit in the Anchorage township is 10 miles an hour. The Automobile Club has determined to address a letter to the officials at Anchorage, asking for a conference, with a view to having the limit raised to at least 12 miles, which is the limit prescribed in the laws of several other townships in Jefferson county. The club also will endeavor to have the Anchorage township officials permit the posting of signs on the roads through Anchorage, advising motorists of the speed limit.

COMMISSION ISSUES WARNING ON LIGHTS

BOSTON, MASS., Dec. 11—The Massachusetts highway commission has been giving the matter of accidents at night thorough consideration, and as a result it has issued a statement to motorists threatening summary action where drivers think they can use their own judgment and as a result figure in a mixup. There is nothing in the new motor law compelling motorists to use any certain kind of light and some of them have done as they pleased. The warning letter of the highway commission covers similar conditions in other big cities. It reads:

"A number of accident cases have been heard by the Massachusetts highway commission within the last few months which have made plain one frequent cause of great danger to both the motorists and the public in general. That is the operation of motor cars when there is not light enough to enable the road and the persons using it to be seen clearly, at such a rate of speed that the operator is not able to stop his car in time to avoid a collision. These accidents, and there have been many of them and several resulting in death, have invariably happened when the motor cars had no acetylene gas lamps lighted. The operator, without them, could not see far enough ahead, at the speed at which he was moving, to stop in time.

"Motor cars have collided from this cause with derricks, platforms, teams going in the same and in opposite directions, have run over foot passengers and have even run through a board fence and dropped onto a railroad track.

"While there is no provision of law requiring the use of searchlights, and possibly they are not needed in well-lighted city streets, the commission feels that it should call the attention of all motorists to the matter, since operators who have come before the board have seemed to think that if they were upon the right-hand side of the road, and if they had the lighted lamps which the law does require, and if they were not operating at a greater speed than the law permits at that point on the road, no fault could be found with them if they struck, for example, a foot passenger who was in the road and who, they claimed, should have been on the sidewalk.

"In one case a foot passenger was not seen because of an electric light which may have dazzled the operator somewhat. Every operator must realize that when he has no searchlights he cannot see far beyond a bright electric light and that he runs quickly into a dark zone. Such conditions have caused two deaths, at least.

"The board feels that operators cannot be exonerated from blame under such circumstances, and that, whether they have searchlights or not, all persons are bound to operate at a speed which is reasonable and proper under the conditions which exist. And a speed is never reasonable and proper if, under any conditions, the operator cannot stop his car when he sees an object on the road before he strikes it. If necessary he must stop his car and cease to operate when he cannot run it so as not to endanger other users of the highway who are exercising reasonable and due care.

"This rule should be applied not only where the streets are imperfectly lighted, or where one is dazzled by an electric light, whether a street light or that of a street car, but around corners and curves, or where one's view is obstructed by other vehicles in passing, or when one cannot see clearly because of a fog or mist.

"The board feels compelled to make this announcement at this time because of the many recent accidents and fatalities in which both pedestrians and occupants of motor cars have been involved.

"It desires, therefore, to give notice to all motorists that it will take summary action in all cases coming before the commission when it develops that the foregoing requirements for safe and proper operating have not been complied with. The commission believes that such a proceeding is absolutely necessary for the safety of the public."

ASKS A SIGNBOARD LAW

Baltimore, Md., Dec. 13—The Maryland state motor car commission has prepared a short bill, providing for the erection of sign posts on the roads and highways of the state and to provide penalties for the failure to do so and to provide for enforcement by the state roads commission, which will probably be passed by the next general assembly at the time that the Swann motor vehicle bill is enacted into a law. The substance of this new bill is to the effect that the proper city, county, town and village authorities shall erect and maintain at or near the boundary line of all important thoroughfares leading out of cities, towns or villages guide posts for the direction of travelers, which shall be a substantial post not less than 8 feet high, near the upper end of which shall be placed a sign of metal or wood upon which shall be plainly marked the name of the next town or place—and of such other towns or places of note as they may think proper—to which each road leads, the number of miles to the same, and the figure of an arrow pointing towards such town or place. In the case of the county commissioners they are to have signposts of similar dimensions at the intersections of important highways for the same purpose as above prescribed. Should the proper authorities in the cities, counties, towns and villages fail to comply with the provisions of the proposed law after 10 days' notice from the state roads commission the state roads commission shall erect such signposts, paying for the same out of its funds and shall be reimbursed within 10 days by such county, city, town or village. Persons destroying such signs shall be subject to a fine not exceeding $25 for the use of the community to which such signs may belong.

TEXANS ARE PRACTICAL

Dallas, Tex., Dec. 12—Something out of the ordinary in the way of a motor tour is the north Texas endurance and good roads tour which is to commence on Thursday at Dallas. The primary object of the tour, it is announced, is to encourage the good roads movement. The secretary of the Dallas chamber of commerce will be furnished a car which is to be known as the good roads special. Prominent men will occupy this car and short speeches on the good roads movement will be made at each of the stops. Also a plentiful supply of good roads literature will be handed out along the route. G. B. McGraw, secretary of the Automobile Dealers' Club, stated that the tour is to have all features of every day utility, thus eliminating those purely sporting.

The tour will cover a distance of 100 miles through a section of the state penetrated very seldom by any kind of a motoring contest. The route embraces a territory recognized as the most thickly-settled and cultured section of the same size in the southwest.

At each of the night stops public good roads meetings will be held, and the value of the modern motor car as an independent means of travel for either business or pleasure will be set forth by competent speakers.

EASTERN ILLINOIS ORGANIZES

Springfield, Ill., Dec. 13—Motorists of Mount Carmel, Ill., and vicinity held a meeting recently for the purpose of forming an organization for mutual benefit. Officers were elected as follows: President, J. M. Mitchell; vice-president, B. H. Kamp; secretary-treasurer, C. F. Stein; directors, P. J. Kolb, Martin Walter, Jay Lescher, G. W. Courter, J. H. Decker. The name chosen for the organization is the Eastern Illinois Automobile Association, it being the intention to solicit membership from the surrounding counties. The membership fee was fixed at $1 and annual dues at $3. The association will endeavor to induce all its members to observe the speed law strictly in order that the ill feeling toward motorists in general may be abated, and also will strive for an improvement of the roads. Already the association is said to have obtained promises from the proper authorities that some of the worst spots near the city will be remedied.

PARIS STRUGGLES WITH POSTAL SERVICE

PARIS, Dec. 5—Paris was the first city in the world to adopt motor cars entirely for the carriage of mail from suburban to central offices, and from the central to the various railroad depots, so it can be accepted as a model to be followed, so far as details of organization are concerned. Within 1 year of the complete conversion from horses to motor cars the contracting company has declared itself bankrupt, has abandoned its worn-out vehicles to the authorities, and the postmaster general, after vainly endeavoring to get another company to take over the transportation of mails, has been obliged to do the work himself with the material of the bankrupt company and temporary assistance from taxicabs.

The failure is due to bad management and not to any inferiority of the mechanically-driven vehicle compared with the horse species. About 5 years ago the postal authorities, in order to allow of later closing of the mails in the sub-offices, experimented with electric wagons in place of horse vans. The electrics soon proved unsatisfactory, and gradually attempts were made with gasoline vehicles. With a view to economy some of the old horse vans were transformed into unsightly motor cars, and in still more numerous cases the bodies of the horse vans were mounted on motor chassis.

Towards the end of 1908 a Lyons syndicate connected with the La Buire Automobile Co. entered into a contract with the postal department for the entire transportation of mails in Paris by motor car. About 150 closed vans were to be put into service, thirty of this number being considered as reserve. They were of three different types, carrying loads of respectively 1,800, 2,600 and 4,000 pounds. The mileage was fixed at an average of 50 per day for each vehicle, and the average speed for the journeys had to be not less than 13 miles an hour. A bad start was made with only half the necessary number of cars, the result being that in order to carry all the mails these had to be kept running for 22 hours a day, making proper verification difficult and repairs almost impossible until the vehicle had been completely put out of business.

It was not long, too, before the contracting company found it had made a serious mistake in guaranteeing an average speed of 13 miles an hour in Paris. The central postoffice is in the most crowded portion of the city, the railroad depots are also situated in districts where street traffic is most intense. The individual journeys never were more than 2 or 3 miles in length, with the result that if 2 or 3 minutes were lost at the commencement through a block in the traffic, an excessively high speed had to be maintained to gain the time lost. An average of 13 miles an hour in Paris meant speeds at certain moments of 25 to 30 miles an hour. Such a rate of travel was disastrous to the vehicles, obliged to advance by leaps and bounds, throttle wide open as long as possible, with harsh usage of the brakes when collisions were inevitable. It was equally disastrous to the public, accidents occurring every day, some of them, unfortunately proving fatal. With its 150 cars in a worn-out condition and ruin staring it in the face, the company a few days ago refused to continue with its contract, although this refusal meant the abandonment of all its vehicles to the postal authorities. Under the contract the company had undertaken to carry the mails at a rate which practically worked out at 17 cents a mile. In view of the high speed and exactitude required this sum was found to be far too low. For an ordinary delivery service, where speed was not absolutely necessary, and in districts outside of Paris, where gasoline is cheaper, it might have been possible to make a profit. It proved impossible to do so in the case under consideration.

REVAL TAXICAB, SHOWING CAR WITH COUPE TOP UP

At present the postal authorities are running the cars themselves, but being without expert management and having to deal with a fleet of vans almost worn out from neglect and overwork, have to rely considerably on outside aid from the taxicab companies. An endeavor has been made to find a company willing to run the abandoned cars, but without success. It will doubtless be necessary for the postal authorities to undertake the service itself to the best of its ability until a fresh company has had time to get together a fleet of machines. It is certain that in order to obtain a satisfactory service the postal authorities will have to be prepared to pay a higher price and be content with a lower average speed, unless some badly needed improvements can be made in Paris traffic conditions.

Despite the unsatisfactory nature of this first attempt to abolish the horse in the mail service the authorities have no intention of abandoning mechanical traction. The time saved and the greater reliability are too considerable to allow of the horse being introduced again. Even when the present badly organized scheme was at its worst relief was obtained not from the horse owners but from the motor taxicab companies. The only work that is left to the horse in the Paris postal service is in drawing the buses which carry the letter distributors to their rounds. As the distance is not great and the men drop off the vehicles every few hundred yards on reaching the commencement of their rounds the slow speed of the horse bus is to be preferred to the more rapid motor car.

Paris is now taking lessons in traffic regulation from New York. Colonel Eno, who claims to have done much to put traffic straight in New York city, undertook to train the lawless Parisian driver to a true respect for the rules of the road. The first experiment has been made in the Rue de la Paix, at this time of the year one of the most crowded streets of the city between 2 and 5 p. m. Mounted municipal guards were instructed under the direction of the American colonel to perform the same service as the mounted police in New York city. The guards occupied position at intervals down the center of the street and made the traffic keep in well defined lines, not more than three abreast. It was forbidden to cut across the street in the free and easy manner of the Parisian cab driver, crossings being made on the American system at the intersection of streets only. The experiment having proved such a success, it is intended to extend the system to other portions of the city and continue it until the Parisian driver is thoroughly trained. An amusing feature of the innovation was that foot passengers were convinced that

the municipal guards had been called out for the purpose of doing honor to foreign royalty, and gathered in such crowds that extra unmounted police had to be called out to keep the sidewalks clear. Motor car and other drivers, too, seeing the mounted guards, concluded the street was closed or about to be closed to ordinary traffic made a detour to avoid the Rue de la Paix.

EXPORTS AND IMPORTS

Washington, D. C., Dec. 13—The splendid increase in the export trade in motor cars and parts is indicated in the latest returns of the government's statistical bureau, which show that during October last 338 cars, valued at $439,326, and parts valued at $83,443, were shipped abroad, while in October a year ago the number of cars exported was 106, valued at $165,837, with parts valued at $47,938. During the 10 months ended October the number of cars exported increased from 1,918, valued at $3,971,406, in 1908, to 2,764 cars, valued at $5,921,033 in 1909. During these periods the value of the parts exported increased from $525,097 to $701,593.

Shipments of cars and parts during October last were made to the following countries: United Kingdom, $121,802; France, $29,839; Germany, $3,154; other European countries, $20,533; British North America, $157,314; Mexico, $57,682; West Indies and Bermuda, $12,643; South America, $11,235; British East Indies, $2,587; British Australasia, $30,226; other Asia and Oceania, $58,433; Africa, $13,336; other countries, $3,985.

There was a drop in the imports of motor cars in October last as compared with the imports of the same month a year ago. During the latter period the number imported was 179, valued at $327,511, decreasing to 114 cars, valued at $290,857, in October last. However, the imports of parts increased from $54,349 to $84,084 during these periods. The number of cars imported during the 10 months' period of 1908 was 1,135, valued at $2,131,400, increasing to 1,352, valued at $2,509,271, during the same period of this year. Imports of parts likewise increased in value from $505,818 to $740,455 during the same periods.

APOKONIN NEW MATERIAL

Washington, D. C., Dec. 13—Consul Ralph C. Busser, of Erfurt, Germany, writes of a new compound called apokonin, for allaying dust and improving the surface of roads, which has lately been prepared and tested in Germany with favorable results. He says in the Daily Consular and Trade Reports: "One of the matters now receiving the special attention of German scientists, highway authorities, and engineers is the treatment of streets and roads for the purpose of obviating dust and mud. While the modern paving of streets and the more solid construction of roads resulting from the use of macadam and other hard materials have largely eliminated the mud and the consequent clogging of traffic in periods succeeding heavy rainfalls, the dust has still remained to plague the traveler and to menace the public health by the absorption and distribution of bacteria. One of the results of these recent experiments is the preparation of the substance mentioned, apokonin, which has been pronounced by some technical observers as the best and most lasting road covering yet brought out. The merits of this process were discussed at the recent convention of scientists and physicians held in Salzburg, Germany. The process is secret, but it is known that coal tar oils are the main ingredients. The heavy, penetrating qualities of the oils give great binding power to the composition. This, together with the pressure applied, produces a formation iron-like in its consistency, making the surface of the road, it is claimed, so smooth and hard that snow and rain cannot penetrate.

NEW FRENCH CARS

Paris, Dec. 1—A new style of taxicab has recently been introduced abroad and is now being tested in Paris. It is of the hansom-cab type, with the driver's seat elevated behind. This construction has a number of points in its favor, chief among which is that of the broad and unobstructed view which it affords the passengers. It is claimed that this construction may develop serious mechanical disadvantages, but these could in all probability be easily overcome. The motor is a single cylinder type of 9 horsepower. The cab is the Reval.

No Road Racing in Europe Next Year

Paris, Dec. 6—There will be another year without racing in Europe, owing to the French grand prix having failed to fill. When the entry list was closed the racing board of the Automobile Club of France was in possession of twelve cars instead of the forty-five it had fixed as a minimum for the holding of a pure speed test next year. The firms that had decided to show their speed ability under the no-limitation rule were Benz, de Dion-Bouton, Rolland-Pilain and Hispano-Suiza. One of these firms, the de Dion-Bouton company, only had entered because of the personal conviction of the Marquis de Dion that it was a mistake on the part of the French manufacturers to allow the industry to become nothing more than an industry, as it is tending to become through the absence of racing and shows. Three or four firms failed to send in their entry fees because of the conviction that the necessary forty-five cars could not be obtained. There appears to have been a belief among the members of the racing board that the necessary forty-five cars could be obtained, for before the race was definitely announced personal inquiries were made in all the factories and the promise of forty-two cars was made. Thus it only needed a few foreign entries to obtain what the club considered a necessary minimum. After promising, however, the big firms banded themselves together against any race and the enthusiasm of the smaller constructors quickly fizzled out. Belgium has come forward with the promise of two races on the famous Ardennes course, one of them to be for limited bore and the other for unlimited cars, but in view of the French refusal to take part in any speed event it is very doubtful if it can carry it through on its national resources. The abandonment of the grand prix doubtless carries with it the death of the proposed aeroplane race from Dieppe to the English coast and return, which was to be one of the items of a week's sport in the historic land of Normandy.

REVAL HANSOM TAXICAB WITH COUPE TOP DOWN

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

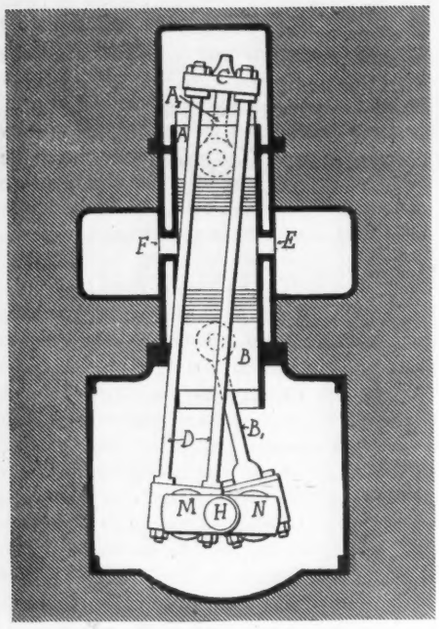


FIG. 1—GOBRON-BRILLE MOTOR

GOBRON-BRILLE MOTOR

LE ROY, ILL.—Editor Motor Age—Will Motor Age, through the Readers' Clearing House, illustrate the Gobron-Brille double-piston gasoline engine made in France?—H. J. Flegel.

The Gobron-Brille motor has been quite prominent in France for several seasons. It is a four-cylinder water-cooled motor with the cylinders in pairs, and two pistons in each cylinder as shown in the sectional views, Figs. 1 and 2, of the end and side of a cylinder pair. One piston A goes up while the other B goes down. The piston A reciprocates in the top half of the cylinder with B in the lower half, the two meeting mid-way of the top and bottom. Both pistons are attached to the same crankshaft H. The piston B connects through a short connecting-rod BI with one throw N of the crankshaft and the piston A connected through a short connecting-rod AI with a crosshead C and from this crosshead by a long connection-rod D with a throw M of the crankshaft, this throw M being set at 180 degrees to the throw N. Mixture is taken into the cylinders at the right through the opening E. Exhausting is from the left through the port F. The spark plug is located on top of the inlet port close to the cylinders but does not show in the section. The action of double pistons is practically identical with that of a single piston, except that the top one A acts as a moving cylinder head. When an explosion occurs B is forced down on one throw of the crankshaft and A pulls up on the opposite throw. Thus there is a decided lessening of vibration. Using an upper and lower piston and double connecting rods necessitates enclosing the entire waterjacket and cylinder in an outer casing K which affords a space between it and waterjackets of the cylinders for the connecting rods D to operate in. Otherwise the cylinder castings with their waterjackets are of standard design. This covering K gives each pair of cylinders a house-like appearance. Ports for the intake and exhaust valves are on opposite sides, the exhausts on the left and inlets on the right. Both sets are mechanically-operated, two camshafts within the crankcase being needed.

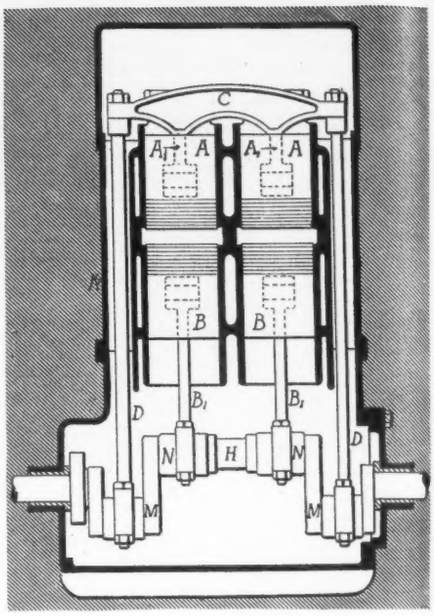


FIG. 2—GOBRON-BRILLE MOTOR

FRONT-WHEEL BRAKES

Chicago—Editor Motor Age—I was interested in reading in your report of the Olympia show the fact that the Sheffield-Simplex motor car is fitted with brakes on the front wheels. I should like to see an illustration of this brake, and know what efficiency or merit there is to front wheel brakes. I would like to see illustrations of the Bentall piston-valve motor.—Reader.

The Sheffield-Simplex car is provided with front-wheel brakes and detachable wire wheels of special design. According to Engineering, the brake drums and expanding shoes of the front wheels are of the same design and pattern and are interchangeable with those for the rear wheels. The expanding shoes S, Fig. 3, are faced with raybestos and the expansion of these is by connection with the rod R, bellcrank B fulcrumed at F, and a rod R1 connecting with the brake pedal. The rod R in turn operates with a second bellcrank B1 which connects with the lever L by which the expansion is accomplished. This lever L is brought vertically over the steering pivot P and when the brakes are applied the lever L has a downward movement which works the desired expansion in that the expanding shoe is made in halves and hinged at the bottom. The road wheel W is removed in the usual way by unscrewing a nut at the outside end. In addition to this car exhibited at the Olympia show there were two or three other cases of front-wheel brakes.

According to official tests, conducted by the Royal Automobile Club of Great Britain on front-wheel brakes, it was discovered that at a speed of 16½ miles an hour the car only deviated 4 inches from

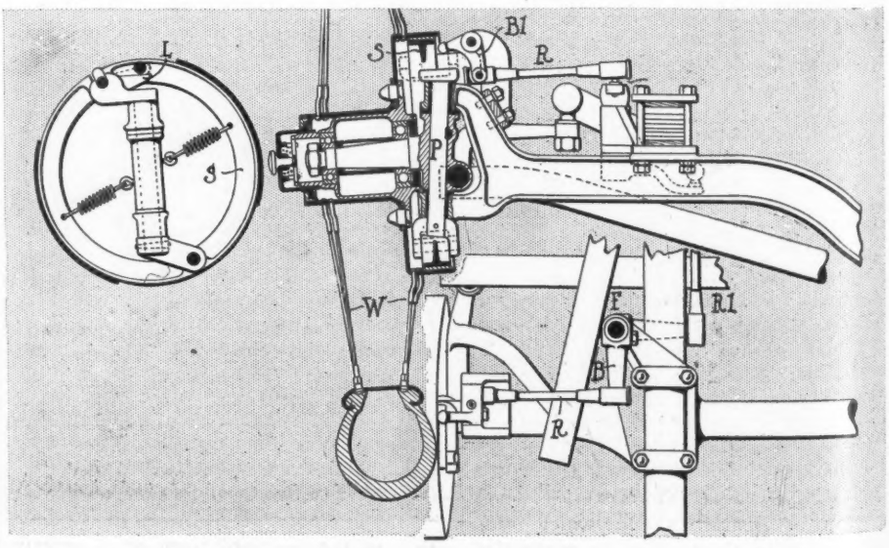


FIG. 3—SHEFFIELD-SIMPLEX FRONT-WHEEL BRAKES

its straight course when the brakes were applied; whereas, at a speed of 16 miles an hour there was a deviation of 15 feet to one side of the straight course when the rear-wheel brakes were applied. According to Motor Age, May 18, 1909, two cars were used in the test. One was a 15-horsepower Humber weighing 2,774 pounds and the other a 16-horsepower Albion covered van weighing 5,432 pounds. The test was held on an area 60 by 30 feet covered to 1½ inch with a mixture of mud and soft soap. Two courses, straight and curved, were used. The Humber in the first test followed the straight course at a speed of 12 miles an hour with the clutch out and brakes off. There was no deviation from the course. In the second test with the car running 16½ miles an hour the front-wheel brakes were applied, locking the wheels for 37 feet, and the car deviated but 4 inches. In the second test with the rear brakes it deviated 15 feet and when stopped was facing in the reverse direction. In the next test both front and rear brakes were applied and a deviation of 11 feet was noted. In the last test the car was sent at 16 miles an hour, the front-wheel brakes applied, and the car continued in a straight course with the front wheels locked.

The Albion van was given its tests. At 12 miles an hour with the front brakes only, it maintained a perfectly straight course and stopped in 49 feet. In the second test, applying both front and rear brakes, it stopped in 18½ feet with a deviation of 10 inches.

The Bentall motor, which was mentioned in these pages in connection with the Olympia show report, is illustrated herewith in end and side sections. This motor can be looked upon as an outcome of the introduction into England of the Knight sleeve valve motor. It is manufactured by E. H. Bentall & Co., Maldon, Essex, England. The side view shows the overhead camshaft K driven by means of a vertical shaft S at the forward end of the engine which takes its drive from the crankshaft. In this motor the intake valves, as shown in the end section, are at the left and the exhausts at the right. The slide or piston valves P are hollow with a port corresponding to the port in the cylinder and a partition just above it. The communication with the inlet and exhaust pipe is through the bottom of the valve. The camshaft K, driving the valves, rotates at but a fourth of the speed of the engine. The valves are so arranged that the ports are opened at the middle of the stroke instead of at the end, so that they open twice to each revolution of the shaft K. These valves have rings both above and below the ports leading into the combustion chamber; they are balanced and no pressure comes on the valve gear because of the pressure in the cylinder.

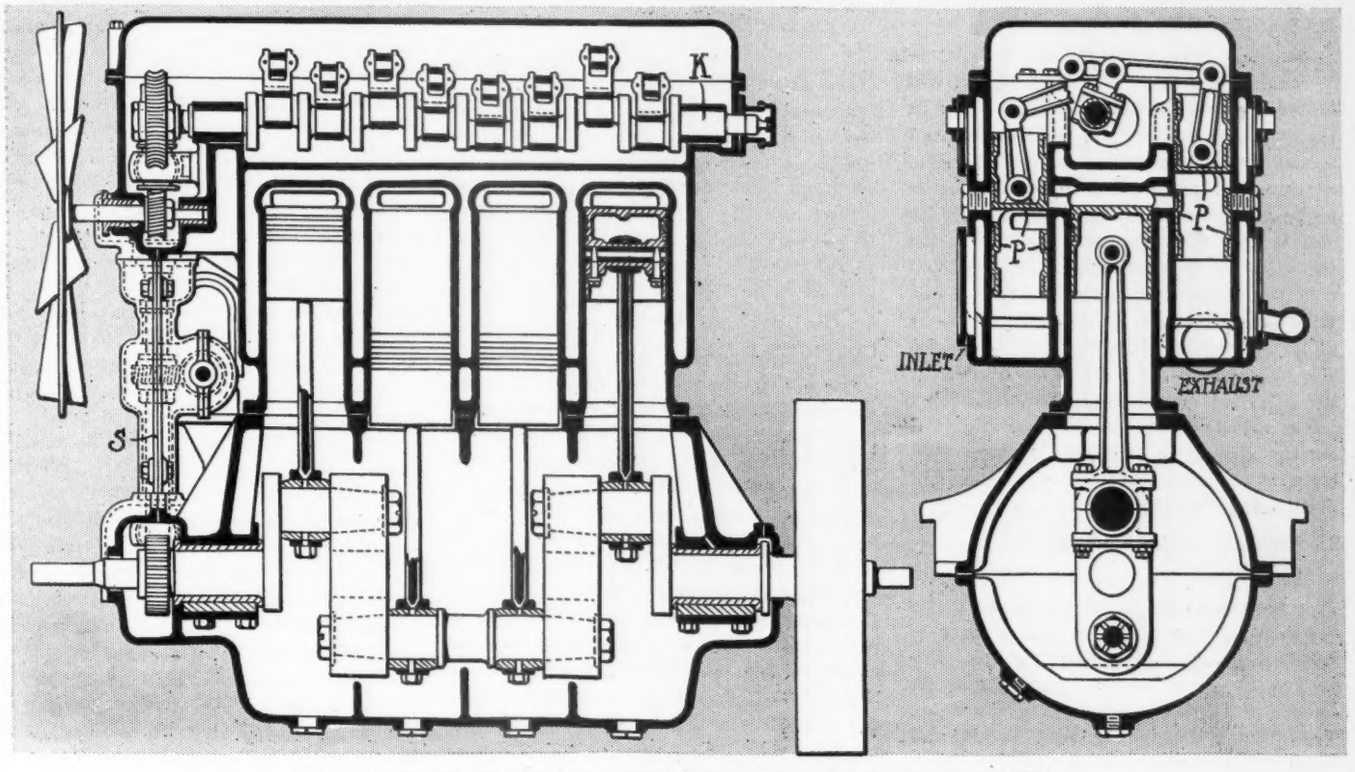


FIG. 4—SIDE AND END SECTION OF THE BENTALL PISTON-VALVE FOUR-CYCLE MOTOR

CORRECT MAGNETO NAMES

New York—Motor Age—Isn't it time for some linguistic genius to arise and offer a suitable set of names for magnetos and magneto systems by which the present confusion and lack of accuracy might be avoided? Imagine a school teacher—motor school, of course,—asking his pupils to define a high-tension magneto. It is said that grocers classify the staple product of the hen into fresh eggs, strictly fresh eggs, and "just eggs." In the same way we have the high-tension magneto, true high-tension magneto and the plain magneto which usually satisfies the novice.

The trouble appears to arise from the fact that, while the spark ultimately produced is of the high-tension variety in nearly all cases, the magneto in which the impulse originates may be either high or low-tension. What the user is mainly interested in is the spark rather than the magneto, since the latter is only a means to the end. Consequently, when asked what ignition system he has or desires, he replies high-tension, as if that ended the matter. To those in the trade, however, the matter is not so simple. Distinction between types is necessary, and it does not seem more reasonable to describe a magneto according to the ultimate spark than it would be to name the style of carriage according to the breed of hose that happened to pull it.

A magneto containing within itself the elements necessary for producing a high tension spark is fairly described as a high-tension magneto, and its makers should not be driven to such verbal shifts as arc light, arc flame or the prefix true to indicate his meaning, any more than the car builder should be required to prefix actual before his horsepower rating. The real need seems to be for some phrase to describe the type of low-tension magneto whose current is delivered to a step-up coil and there transformed to high-tension. To call it low-tension without explanation is impossible, and low-tension with separate coil is equally so. Why not simply name it the coil-type magneto, leaving the jump spark to be inferred? Belt-driven magnetos having separate coils could then

be described as non-synchronous magnetos.

A similar need exists for verbal distinction between the various dual, semi-dual and hemi-demi-dual systems now on the market. Probably at least half a dozen could be counted, ranging all the way from that using the same interrupter, coil, distributor and plugs in both systems up to the only real dual system having the magneto and battery circuits entirely separate, even to the spark plugs. The weight of practice seems to be divided between the real dual system and the system which uses the same distributer and spark plugs, but with separate interrupters for the two circuits and a special coil for the battery circuit. The writer confesses himself staggered by the problem of finding a name even for the second of these two, but some one ought to find it, and when found it ought to be adopted.—Herbert L. Towle.

HAS ONLY ONE SPARK

Lincoln, Nebr.—Editor Motor Age—Through the Readers' Clearing House, will Motor Age inform me on the following: In the regular vibrator coil, the primary and secondary wiring having no metallic connection, so through what medium does the high-tension secondary current complete its circuit from the motor to the coil? In the non-vibrator type of coil is there a continual spark at the plug as long as the distributer points are in contact, the same as in a vibrator coil, or does the spark occur only when the contact is broken at the distributer?—A Subscriber.

The primary and secondary are grounded on the core. In the non-vibrating coil, there is one spark on making contact and one on interruption of flow of current.

BROWNVILLE, TEXAS, ROUTE

San Antonio, Tex.—Editor Motor Age—In reference to the inquiry of E. R. Stotts regarding the roads from Des Moines to Brownsville, Tex., we offer the following suggestions as a route: From Oklahoma along the Santa Fe railroad to Gainesville, Tex., thence Denton to Fort Worth and Waco via Cleburne and Hillsboro. From Waco through Belton, Georgetown to Austin, thence to San Antonio via San Marcos, New Braunfels. From San Antonio to Beeville vial Floresville and Karnes City. The rest of the distance is unknown to us, not having covered the route thence on, but understand the roads are fair. From San Antonio down through Floresville the roads are rather sandy, but cars can easily negotiate them.—Automobilious Subscribers.

BOOK ON TWO-CYCLE MOTORS

St. Paul, Minn.—Editor Motor Age—I am desirous of getting a handbook of engineering data on the two-cycle engine, as used in motor cars and boats. Has Motor Age a publication specializing in this particular branch of the work? I note Motor Age advertises "Modern Gas and Oil Engines" as an assistant to draftsmen in the design of gas engines, but doubt if it has the two-cycle information I desire. I would like some information relative to a handbook of this character. I desire a book something like Robert's' "Gas Engine Hand-Book," except that it must be up-to-date and deal with high speed motor car and motor boat engines.—W. L. C. Chambers.

Motor Age has no publication dealing in detail with two-cycle motors; the two-cycle motor being treated in general with four-cycle and other types.

CRACKED WATERJACKETS

Grantville, Kan.—Editor Motor Age—I have a Pope-Hartford roadster and the waterjacket on the forward pair of cylinders cracked from freezing. Will Motor Age kindly advise me if oxygen acetylene welding is satisfactory, or will it be necessary for me to buy a new pair of cylinders and jackets? The crack is only in the jacket and does not show in the cylinders. —Charles Kleinhans.

It is possible if the crack is not too large it could be closed by rusting with a solution of sal-ammonia. If the crack cannot be satisfactorily closed this way the welding process can be satisfactorily used, although there will be more expense connected with it. It is customary to use a 50 per cent solution of ammonia and water or sal-ammonia. Either will do the work in from 24 to 48 hours. The jackets should be filled with the solution.

CRITICIZES CAR COST

St. Louis, Mo.—Editor Motor Age—In the November 11 issue of Motor Age I noticed the errors of "City Salesman" in his computation of mileage expense and was tempted to call attention to it at the time, but passed it on to some one else, which has been done in the December 9 issue by White Streak, who makes a similar error in computation of mileage expense, although attempting to correct a fellow motorist. "City Salesman" expense should be 8.99+ cents per mile, and White Streak should be 1.83+ cents per mile and not .018 cents as he states. White Streak confuses one by using both the decimal and the cents sign together, making his cost appear 18/1000 cents per mile.—H. L. Hughes.

FORD TIRE RECORD

Atlantic, Ia.—Editor Motor Age—In Motor Age, December 9 issue, I read of a record of 3,692 miles made with a Reo fitted with Michelin tires, and a Detroit with Palmer tires a mileage of 4,479. I wish to state that the Ford No. 2 of the New York-Seattle race, on its way back to New York, stopped here and we changed a Firestone tire on the right rear wheel which had not been off since leaving New York, a distance of 10,562 miles, without a pucture. This was a statement made by Scott, the driver, and his mechanic, and he also stated to the crowd watching the change of tires that when going through Death Valley they let most of the air out of the tires so that the car would not sink in the sand so far and which would be hard on the tires. We still have the tire here, and although the rubber is worn and scraped the fabric seems to be in good shape. Another good record is that of a real estate dealer in Exira, Ia., who bought a Ford, model T, from us last spring and has made 7,000 miles with Firestones without any tire trouble whatever. Now, who can say the Ford is not easy on tires!—J. E. Southwick.

THE HORSEPOWER TROUBLE

Madison, S. Dak.—Editor Motor Age—I note the communication of E. P. Andrews in Motor Age, December 2 issue. This horsepower business is certainly a puzzling one and a few more examples can be added to the list given by Mr. Andrews. There is the 1909 Velie with 4 by 4-inch cylinders and rated at 30 horsepower. The Regal is rated at the same with same size cylinders. The Rutenber small motor is rated at 25-30 horsepower and has 4 by 4-inch cylinders. The fact is that when one wishes to consider the horsepower of the motor itself—leaving out the matter of losses through inefficiency, etc.—the size of the valve plugs has an important role as the stroke and bore, with the valve lift an important factor. For instance, the 1910 Mitchell has 4¼ by 5-inch cylinders with 1½-inch valves; the E-M-F is 4 by 4½ with 2⅛-inch valves. Which has the more power? I think the Mitchell cars are furnished in either 3¼-to-1 or 3¾-to-1 gear ratio, I believe; not 3½-to-1, as stated.—H. H. Frudenfeld.

The fact that one car has larger valves than another should be sufficient reason to conclude that with all other things equal the motor would be capable of higher crankshaft speeds. The profile of the car, however, has a most important bearing on the power obtained from motors. This year on a certain make of racing cars by changing the cam design so that the opening of the valve was altered 5 miles an hour higher speeds were obtained. Larger valves should give higher speeds, but the amount of lift given these valves and the nature of the lift are big factors to be considered.

THE BROWNVILLE-TEXAS ROUTE

Waco, Texas—Editor Motor Age—I noticed recently in Motor Age an inquiry from E. R. Stotts for a route to Brownsville, Texas. The best route after leaving Oklahoma City is via Dennison, Texas, thence to Dallas, Waco, Georgetown, Austin, San Marcus, San Antonio, thence to Laredo; from this point down the Rio Grande river to Brownsville. This route is longer, but the Kingsville route given is impossible because of the drifting sand. This route is very attractive and especially beautiful in the spring.—O. H. Soffington.

Legal Lights and Side Lights

PEDESTRIANS MUST BE CAUTIOUS

A DECISION recently made—Kauffman v. Nelson, 73 Atlantic (Pa.)—will appeal to drivers of motor cars in crowded streets as eminently fair. The facts in brief were these: The plaintiff, a woman, alighted from a street car at Chambersburgh, Pa., at one of the regular stopping places for cars, but not a street corner. After having gotten off, she started towards the curb about 15 feet away and until she had taken two or more steps, she looked in neither direction for approaching motor cars or vehicles. When she discovered defendant's motor car approaching it was some 50 to 60 feet away, and she claimed that if the car had approached in a straight course it would not have struck her, but that it was swerved away from the street car and towards the curb and consequently struck her as she was stepping onto the curb. The defendant's evidence was that when the plaintiff stepped from the car towards the curb, he—defendant—turned towards the street car in order to pass behind her, but when he saw her hesitate and indicate by her movements that she was going back to the car, he turned his machine towards the curb. In the lower court a verdict and judgment for $4,666.95 was given to the plaintiff, and on appeal the supreme court reversed the case.

In part the court says, "It was the duty of the defendant who knew the car was at a regular stopping place to exercise very great care in passing it to avoid injury to persons going to or from it. A high degree of care is required of the driver of a vehicle in passing a car which has stopped to receive or discharge passengers, but others are not relieved from the obligation of attention and care. There rested also upon the plaintiff the duty to look where she was going and not to rush blindly into danger. The duty to look and to exercise care and vigilance rests at all times upon every one in the use of streets. An instruction that relieves the plaintiff from the duty of looking, and holds him responsible only in case he saw, cannot be approved."

TOLL-ROAD CASE DECIDED

A humorous example of the fast-disappearing prejudice against the motor car is seen in a Pennsylvania case—Scranton v. Laurel Run Turnpike Co., 73 Atlantic (Pa.) 1063—where the owner of a motor car was the plaintiff in a suit brought to compel a turnpike company to allow the plaintiff to drive his machine on the turnpike, after the privilege of so using the toll-road had been denied by the keeper of the toll gate. The plaintiff in his petition says, "The petitioner is the owner of a motor car of which H. D. Warner, of said city of Scranton, is the operator and driver. That the said driver has been licensed by the highway department of the commonwealth to operate a motor vehicle upon the public highways of the state. * * * That the said turnpike road is a public highway. That upon October 5, 1907, said Warner while operating said motor car, which had displayed in a conspicuous place on the front and back of it said license number, accompanied by the petitioner, arrived at the toll gate of the said turnpike company and found the same closed, and the plaintiff requested the toll gate keeper to permit them to pass through said gate, and offered and tendered the toll keeper any toll that the turnpike company might demand for the use of the road. The toll keeper, following the instructions of the defendant, refused to permit plaintiff's car the privilege of passing through said gate. * * * The defendant company by refusing and prohibiting the use of the turnpike road by motor car and by refusing to allow your petitioner to pass through said toll gate and over and upon said turnpike road in said motor car * * * and by allowing teams and wagons the use of the same, is unjustly and unlawfully discriminating * * * against the petitioner and against others who may desire to pass over said turnpike in motor cars; that the said turnpike road is a public highway and the defendant has no legal or equitable right to prevent petitioner's motor car and others who are duly licensed from driving and operating motor cars thereon upon the payment of a just and reasonable toll."

The lower court decided in favor of the car owner and upon appeal the decision was affirmed upon this complaint. The court in part says:

"Said road is a public highway. It has erected toll gates upon the said road and exacted tolls under and in pursuance of the said act and its supplements. It has refused to permit motor cars to use said road." Then the court refers to the statute and states that, according to the act, the road companies may under certain circumstances charge a toll "for a coach, sulky, * * * wagon or any other carriage of burden or pleasure." "The vehicle which the plaintiff was driving must be included in the general designation as 'other carriage of burden or pleasure'." The order asked for by the plaintiff was granted, compelling the defendant to allow motor cars to use the toll road.

DRIVER NOT NEGLIGENT

In a recent Pennsylvania case, Sanders v. Pennsylvania Railroad Co., 73 Atlantic (Pa.) 1010, the facts showed that the plaintiff was riding in a motor car, which was operated by his son-in-law. In the course of the ride, they approached the grade crossing in the city of Wilkes-Barre. The safety gates at this crossing were seen to be raised and no watchman was on hand or in sight to give the motorists warning of a train's approach. Mr. Sanders showed that on approaching the tracks, the car in which he was riding was brought to a stop, or very nearly so, and that upon a signal to proceed from a trainman, the car was driven upon the tracks and then was struck by coal cars which were being backed. Sanders further showed that he was not warned of the approach of the cars. A jury in the court below gave a verdict for $3,500 to the plaintiff, and an appeal was taken by the railroad company. On this appeal the decision below was affirmed. Counsel for the railroad on appeal made the contention that the evidence showed so clearly a failure on the part of the motor car driver to observe his duty at the approach of the crossing that the court would be justified as a matter of law in stating that the plaintiff could not recover, because his negligence contributed to his injury. The court refused to consider this question, and held that such evidence was properly left to the jury in the lower court, which had decided in favor of Sanders.

TOWN LIABLE FOR NEGLIGENCE

"Failure to build and maintain its highways in a reasonably safe condition is negligence and makes the town liable to respond in damages for injuries sustained by anyone by reason of such negligence, providing the person was himself exercising ordinary care," is the construction of the law of highways made by Circuit Judge George Grimm at Monroe, Wis., last week. "The town need not anticipate nor provide against extraordinary or unusual occurrences, nor against the carelessness of drivers. The party who may suffer therefrom is himself presumed to assume risks."

OIL LAW HELD LEGAL

The Wisconsin oil inspection law of 1909, which requires the official inspection and branding of every gallon of gasoline and kerosene used in Wisconsin has been declared constitutional by the Wisconsin supreme court in the suit of the Wadhams Oil Co., of Milwaukee, for an injunction to restrain Chief Inspector Edward L. Tracy from enforcing the law. The state charges a fee of 10 cents for every barrel inspected. About 400,000 barrels of gasoline and 350,000 barrels of kerosene are used in Wisconsin every year.

MOTOR CAR DEVELOPMENT—THE ANHUT SIX

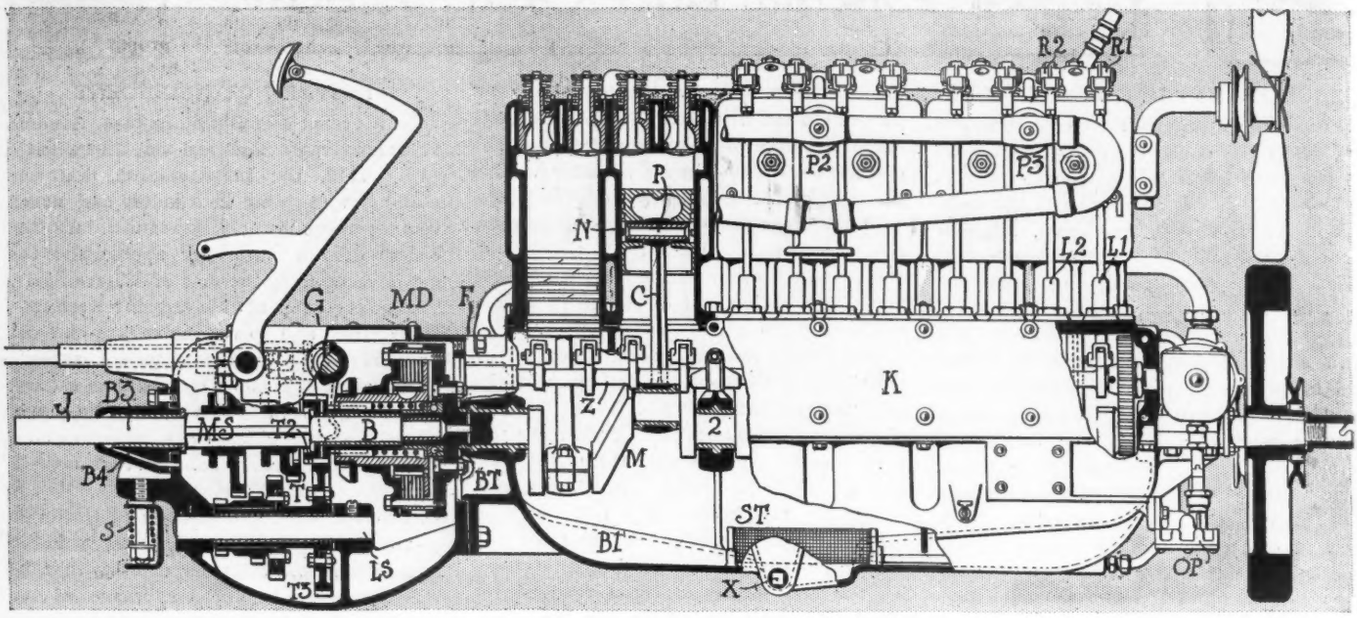


FIG. 1—SECTION OF ANHUT MOTOR, CLUTCH AND GEARSET

MADE in Detroit by the Anhut Motor Car Co., the Anhut, which is a six, using Brownell motor equipment, has other conspicuous features to match. Being one of the newcomers, it will be described in some detail, particularly as the construction shows how well the motor car situation has been standardized. A few short years ago, were a new car to be brought out, some ten to fifteen expert designers would have had the labor for upwards of 2 years to so perfect the design that a model could be whittled out, and the so-called whittling process would eat into another year's time.

Not so with the Anhut; it is launched in the certain atmosphere of standardized conditions; the power plant is that of the Brownell quality; transmission, axles, steering equipment, radiator, chassis assemblage, magneto, carbureter, and, in fact, every single unit, presents all the earmarks of standardization, and that the builders of cars are now approaching the master-car-builders—M. C. B.—stage, is one of the main points to be made.

It is logical to believe that standardization is a condition which should rapidly be brought about; there must be some one right way to do every task; there should be a time when the combined opinion of all the engineers in the industry will be more valuable than the individual opinion of any one of them; the M. C. B. car, while it will not be noted for individuality, will represent the logic of experience, the kind of experience, in fact, that is typical of the successes of all the individual experiences, and the cars so made will, like locomotives, be safe and sane.

The power plant—Fig. 1—is of the unit type, with the motor, clutch and gearbox in a single housing, and the whole is suspended on three points. The motor, of the four-cycle, water-cooled genera, has six cylinders, and its power is transmitted, by means of a propeller shaft with universal joints, to a live rear axle of standard characteristics; the road wheels are of the artillery pattern, with second-growth hickory spokes and felloes of a size to take 34 by 3 ½-inch tires. Semi-elliptic springs, front and rear, with thin, wide plates, assure easy riding, and the channel-section chassis frame is the platform on which the equipment rests. The brakes, in order that they will compare favorably with the rest of the plan, are of assured ability, they being of the external and internal type, engaging drums which are flanged to the rear road wheels. For the steering gear, enough is to say it is of the worm-and-sector type, and a 17-inch hard rubber rim steering wheel is at the disposal of the driver. For the rest, considering the car as a whole, the wheelbase, 110 inches, with standard tread, makes for good road work and lightness, as reflected in I-section front axles, and in many other ways, is not at the expense of strength, but this same lightness, considering a 36-horsepower motor, does represent road work under all conditions that should be adequate for the needs of the most exacting motorist.

Made in Two Types

The Anhut is made in two general types, the one a toy tonneau and the other a roadster, illustrated in Fig. 4. The radiator, for illustration, rests over the front axle; the hood is long enough to accentuate the scheme of the designer, which is to include every evidence of a strictly roadster type of car; and the driver's seat, which is located nearer to the rear than the front axle, is in just the right place to assure easy riding qualities. The seat is low, close to the deck, and the steering wheel is located in the position which was found in racing experience to be the most comfortable and of the greatest utility. The gasoline tank is round, the shape of greatest strength, and of 20 gallons capacity. The general motor layout is illustrated in Fig. 3. A tierod, T, holds the radiator in rigid relation, the tierod being fastened to the dash and a ledge, L, is beaten into form, out of the material of the dash overhang to serve as a resting place for the hood. The filler F, for the radiator, is hinged and a locking bale passes over a cam-shaped rib by means of which the cover is rendered tight, but it can be swung back at small effort when it is desired to fill the radiator, which, including the cooling system, holds 4 gallons of water, and a centrifugal pump is used for circulation.

Peering in at the motor and its accessories, it will be observed that the carbureter is high enough up to be accessible, and the valve actuating mechanism is up and aboveboard where it can be inspected and worked upon. Likewise the magneto M is above the level of the top of the chassis frame, which is a matter of more than little moment in these days when accessibility is regarded as of the first importance.

Motor and Transmission

While looking under the hood has the virtue of affording information of a definite character on the subject of accessibility, the fact remains that in order to appreciate the points of merit residing in the power plant proper, it is necessary to withdraw it from its surroundings, which is done in Fig. 1. As will be observed, the crankcase K is of aluminum, flanged F between it and the gearbox G, and split horizontally, in the crankshaft axis. The flywheel is in front, and the fan is driven by a round belt and the fan is suspended

from a round section bracket and rolls on ball bearings in its housing.

The six cylinders of the motor are cast in pairs, and the Stromberg carbureter is connected to the intake ports by means of a manifold which balances the pressure by circling around through its two branches, connected to the three ports of the three pairs of cylinders at P1, P2 and P3. The magneto is on the right-hand side also; rests on a ledge cast integral with the upper half of the case, and is driven by a gear of the encased train, as a part of the half-time system which fixes the speed of the camshaft. The camshaft, which is inside, is on the right side of the motor, and the tappet-rods extend up from the lifts L1, L2, etc., to the rocker arms on the top of the cylinders, being cut away to show the section of the cylinders, present a view of the valve springs, the valve cages, and the valves in the heads, as shown in the section of the last two cylinders, it being the case, of course, that two valves—inlet and outlet—are placed in the head of each cylinder.

The bore of cylinders is given as 3½ inches and the throw of the crankpin as 2 inches, thus making the stroke 4 inches. The pistons, like the cylinders, are of cast gray iron and each piston is provided with three compression rings above the wristpin to render the pistons tight against compression and one ring N, which passes through a slot in the wristpin P to keep the pin from floating out. The camshaft Z is shown at the sectioned end. The cams are integral and the material used is cementing steel and the camfaces are glass hard.

Connecting Rods Drop Forged

The connecting rods C as shown in the section are drop forged from special steel and the bearing surfaces, at both ends, are adequate. The crankshaft M is of high-carbon steel cut from a billet of crankshaft steel, and after rough machining is

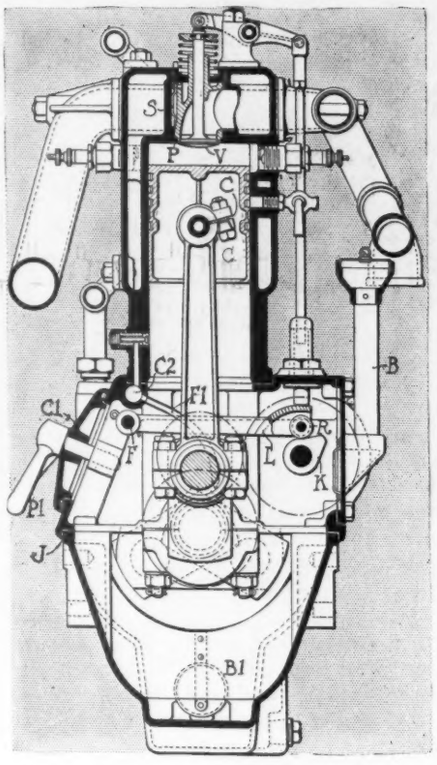


FIG. 2—END SECTION OF MET

hardened and ground. The main bearings 1 and 2 indicate that there is a main bearing on each side of each pair of cranks and the projected area is such as to assure running conditions. The journals are of die-cast nickel babbitt, which is regarded in engineering circles as superior for the purpose.

The question of lubrication is of the greatest importance, and the level for splash is maintained by the pump OP and all excess oil drains back to the oil basin B1; while in the process it is filtered through the strainer ST. The plug X is available for the purpose of draining the system out, or lowering the oil level. In view of the construction which places the rocker arms R1 outside on top of the cylinders, the designer considered it necessary to carefully provide for the proper lubrication of the rocker arm bearings, and this is accomplished by making the shafts on which the arms oscillate, hollow. These shafts are plugged at each end, thus forming an oil reservoir. Oil, which is fed from a spring oiler at the top of each rocker arm, maintains a profuse state of lubrication at all times. Small oil passageways are provided so that excesses of oil pass to all bearings at four points, including the pushrod bearings at the lower end of the rocker arms. Noise, which generally follows wear, is thus aborted, simply because the parts do not generate lost motion.

Power Plant Self-Sustained

The rear end of the crankshaft is provided with a flange F, which engages the housing of the multiple-disk clutch MD and the disks are alternately keyed to the driving and the driven members, respectively, so that when the clutch spring is free it presses the disks into intimate contact and the clutch is then capable of transmitting the torque of the motor to the transmission gears. To release the clutch, pressure is applied to the pedal shown, which actuates an arm, the rounded portion at the end of which engages the pocketed face of the thrust block.

The selective three-speed gearset shows the layshaft LS below the mainshaft MS and since the drive is direct on high gear engagement is made by means of the internal gear T, with the pinion of the master set T2 which the master pinion meshes with the gear T3 to impart motion to the layshaft. For the remaining speeds the sliding—sleeved—gears engage their mates on the layshaft.

The telescope bearing B is long, and a ball-thrust BT takes care of the endwise

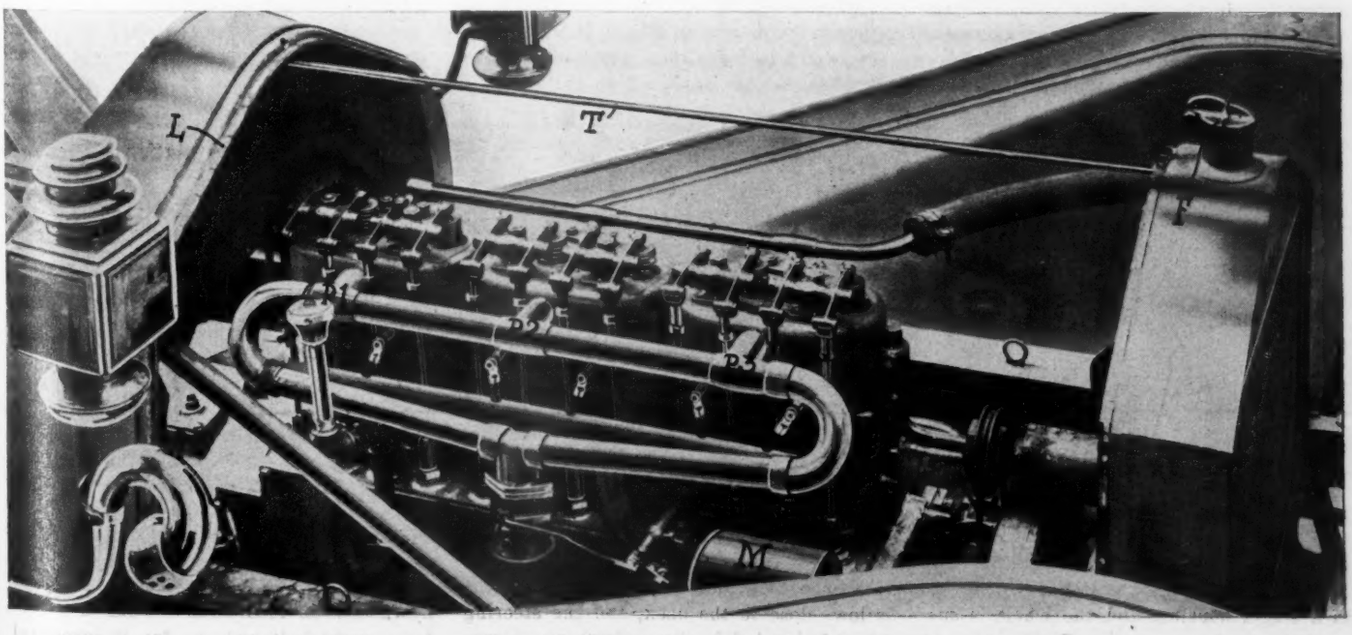


FIG. 3—ANHUT SIX-CYLINDER MOTOR SHOWING LOOP INTAKE MANIFOLD

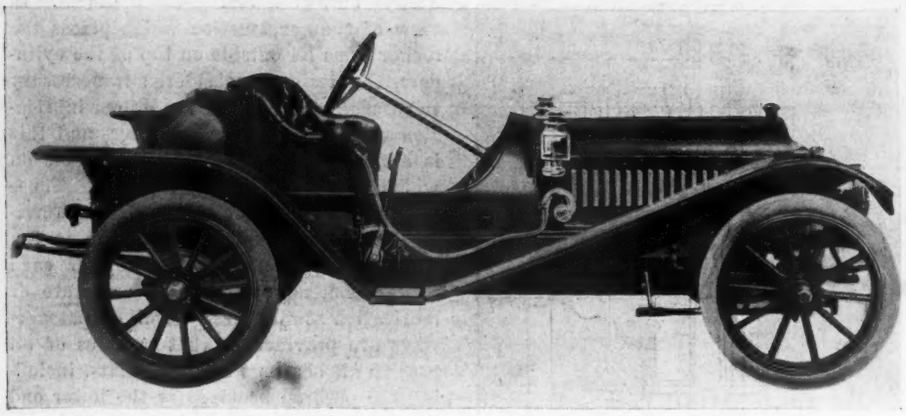


FIG. 4—ANHUT SIX-CYLINDER ROADSTER

component. The outboard bearing B3 is very liberal indeed and the stub-end of the shaft where it engages the universal joint J is splined for a long key. Lubrication at this point is well cared for, and by means of the passageway B4 excesses of oil run back into the case. While the front end of the motor is suspended by arms to the side members, the rear suspension is, as shown, at a point with a spring S, which is placed to impart flexibility. The crossbar is of the channel section and liberal in view of the load.

Fig. 2 is a cross-section of the motor, and in view of specific references to the several parts, as made in Fig. 1, it is offered as showing the clamping means C of the upper end of the connecting rod; flat packing P under the cage of the bevel-seated valve V and the virtue of this method of packing the cage will be seen at a glance, it being the case that expansion is rendered impotent thereby. A little flat spring S back of the cage prevents the same from working around and aids in assembling.

Other Important Details

The cam K is of good shape and the roller R is forked into a supplementary lever L with a fulcrum at F. This construction assures noiseless performance since the lifts have but a thousandth or two of clearance, and this distance is below the noise point. A valve controls the supply of oil to the respective cylinders, and by adjustment provided it is possible to regulate at will the supply of oil to each cylinder.

The breather B has a cap and a baffle to prevent oil from splashing up and out. The cover over the handhole is provided with a packing P1 and a screwed on handle to make it tight; it is quick to detach and virtue resides in the plan. The main oil channel C2 shows plainly in this section and the individual oil feed F is also plainly in sight. The cross-section of the oil basin B1 offers evidence of capacity and the oil-tight joint J is well worth more than passing notice.

Referring to Fig. 5, it will be observed that the crankshaft is suspended to the top half by bearings which are formed in the ribbing system and the two intermediate bearings 2 and 3 are provided with caps C. In the lower half the crankshaft is carried by outboard journals 1 and 4, and this view presents further evidence of the method of oiling, with the oil well W formed in the bottom of this half of the case. The details of the crankshaft, connecting rods, pistons and rigs, are clearly depicted in Fig. 6, and in view of the specific reference in Fig. 1 it will not be necessary to more than point out that the flywheel flange is placed at the rear end.

The Motorists' Bookman

Through the French Provinces

"Through the French Provinces," by Ernest Peixotto, and from the press of Charles Scribner, New York, is an interestingly told series of stories covering motor car and motor boat trips into the French provinces, each trip starting from and ending at Paris. The motor boat trips up the Seine and Oise are replete with interesting character sketches; and the motor trips to Provins, Sens, Memours, Etampes, Chartres, up the Loire valley, to the land of the cliff dwellers, to Chinon and Loches are filled with interest throughout. In speaking of the rejuvenation work the Touring Club of France is doing among the small hotels throughout the provinces the author has to say: "This organization has advocated sanitary rooms at a moderate cost in all provincial hotels. The idea makes a distinct appeal to anyone who knows the old-fashioned, musty rooms of the smaller French hotels, with their heavy-wadded hangings and curtains, their dusty carpets and dark, uncertain corners. These new rooms, or 'chambers T. C. F.' as they are called, remind one, in a way, of a hospital ward. The walls are painted white or some pale color. There is a white enamelled bed, a metal washstand, a bureau, a few simple chairs and a table. Everything can be washed clean. In each of the recent Salons du Mobilier at Paris the Touring Club has offered special prizes for the best design for rooms of this type, with the result that these 'chambres T. C. F.' are now done by some of the leading Parisian decorators and have become attractive in the larger hotels."

The author has shown by a careful selection of information the many interesting traits of the people of the provinces, one of which will suffice to show the general

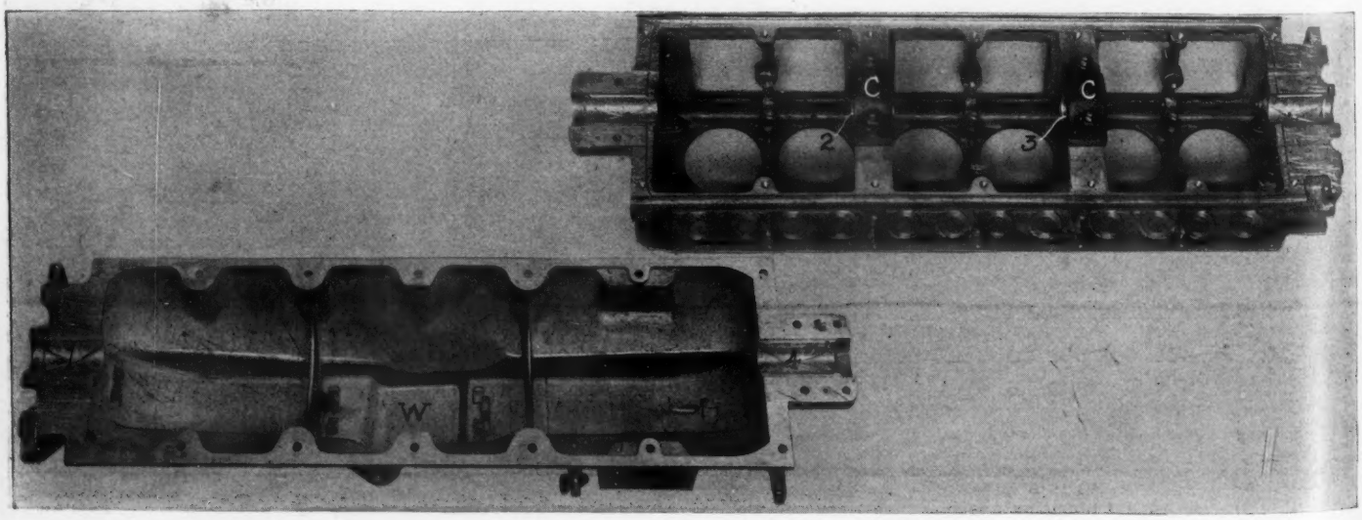


FIG. 5—CRANKCASE OF ANHUT CAR SHOWING BEARING SUPPORT

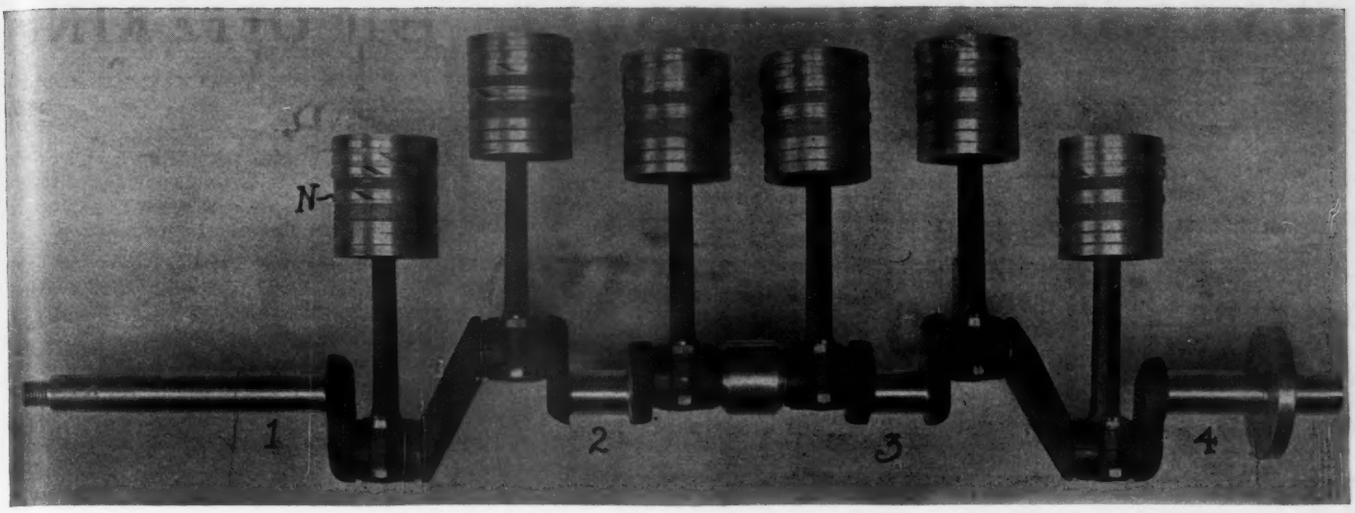


FIG. 6—ANHUT CRANKSHAFT WITH FOUR BEARINGS—N IS SPECIAL PISTON RING

trend of these. During the night stop at Creil the writer says: "We went out of the main road to Clermont to the old church of Nogent-les-Vierges, picturesquely placed on a prominence. Away back somewhere in the middle ages two Irish girls, Maura and Bridget, suffered martyrdom near by and were buried in the cemetery of Nogent, which adjoins the church. Towards the end of the twelfth century a peasant lost a black cow that passed the night lying on the tomb of these virgins. When the owner found the animal in the morning he was dumfounded to see that the side of the cow that had rested on the tomb had turned perfectly white. The miracle was noised abroad and people flocked to see the animal and the place became an object of pilgrimage. Some time after the very same cow again strayed away from home and passed the night in the same graveyard. Next morning it was found lying on the grave of the virgins, and when it rose to its feet what was the amazement of all beholders to find that both sides were now entirely white. The fame of this miracle spread through all France and thousands of people came to see the cow and be cured of their ills. Nogent became henceforth Nogent-les-Vierges, and the relics of the two virgin saints were placed in shrine within the church, where they may be seen to this day." The book is profusely illustrated by pen and ink reproductions made by the author. It is cloth bound and contains 230 pages.

The Italian Highways

"Italian Highways and Byways From a Motor Car," by Francis Miltoun, and published by L. C. Page & Co., Boston, is a 370-page volume of a motor excursion through Italy in which the author tells of the people, the beauties of the country and the cities and villages passed through. For the person craving a general idea of this section of the country the book will prove satisfying, as town after town passed through is dismissed with a paragraph. One example will suffice: "Chiusi, on the direct road, lies embedded in a circle of hills and surrounded by orange groves. It is nothing more nor less than a glorified graveyard, but is unique in its class. Lars Porsena of Clusium comes down to us as a memory of school-time days, and for that reason, if no other, we consider it our duty to visit the Etruscan tomb of Clusium, the modern Chiusi. There are three distinct tiers or shelves of these ancient tombs, and interesting enough they all are, but only the antiquary will have any real passion for them, so most of us are glad enough to spin our way by road another 50 kilometers to Orvieto." Rome is passed over with ten brief pages; Naples and the other leading places are described, as are Milan and the Italian lakeland. A series of maps of the country, following the itinerary of the car, as well as excellent illustrations, adds greatly to the value of the book to the tourists who purposes motoring through Italy or to the student who is bent on a clearer conception of the present abode of the land once inhabited by the Romans.

Inns of Old London

The continental motorist tourist who purposes including an investigation of old London and its suburbs in his itinerary of next year cannot do better than secure a copy of "Inns and Taverns of Old London," by Henry C. Shelby, and printed in America by C. H. Simonds & Co., Boston. It is a 360-page cloth bound volume in which the historic inns are described and the historic associations in connection with them revived. It properly starts out with the Southwark Inns. According to the author "Southwark is really the southwork of London, that is the southern defense or fortification of the city." The Tabard inn was one of the earliest in this part, being the one chosen by Chaucer from which the Canterbury pilgrims set out, the precisionists asserting that such a pilgrimage actually started from this inn in 1388. From Tabard inn the panorama moves on to the Bear, the Boar's Head, the latter in High street opposite the house in which John Harvard, founder of the great American university, was born, etc. The coffee houses are the subjects of several chapters, as are the clubs of the city and the pleasure gardens. Illustrations of practically all the interesting points are included as well as many of the habitues of them who are now honored by resting places in Westminster abbey. To lovers of Shakespeare, Dickens, Ben Johnson and the many other English authors who had their frequenting abodes in London the book will prove of especial interest, because in every page some incidents in the lives of these immortals is woven into the sidelights of descriptions. The book is not a description of buildings but a running history with these old inns.

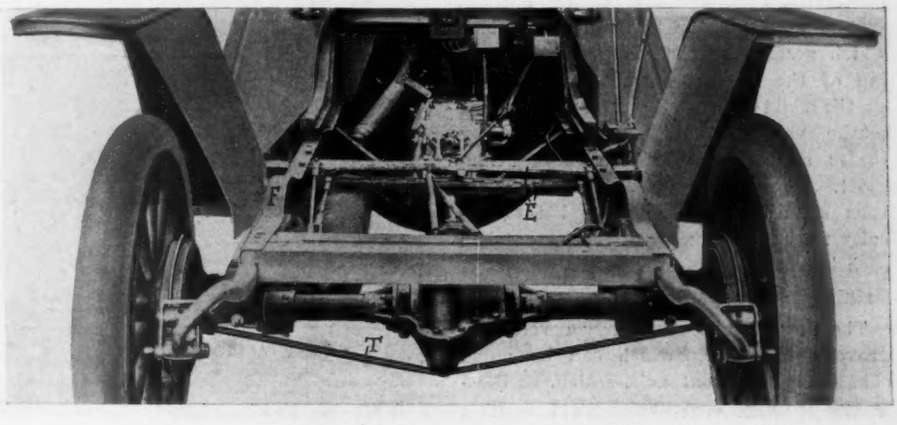


FIG. 7—REAR VIEW OF ANHUT CHASSIS

SEVERAL RAINIER MODELS 1910 OFFERING

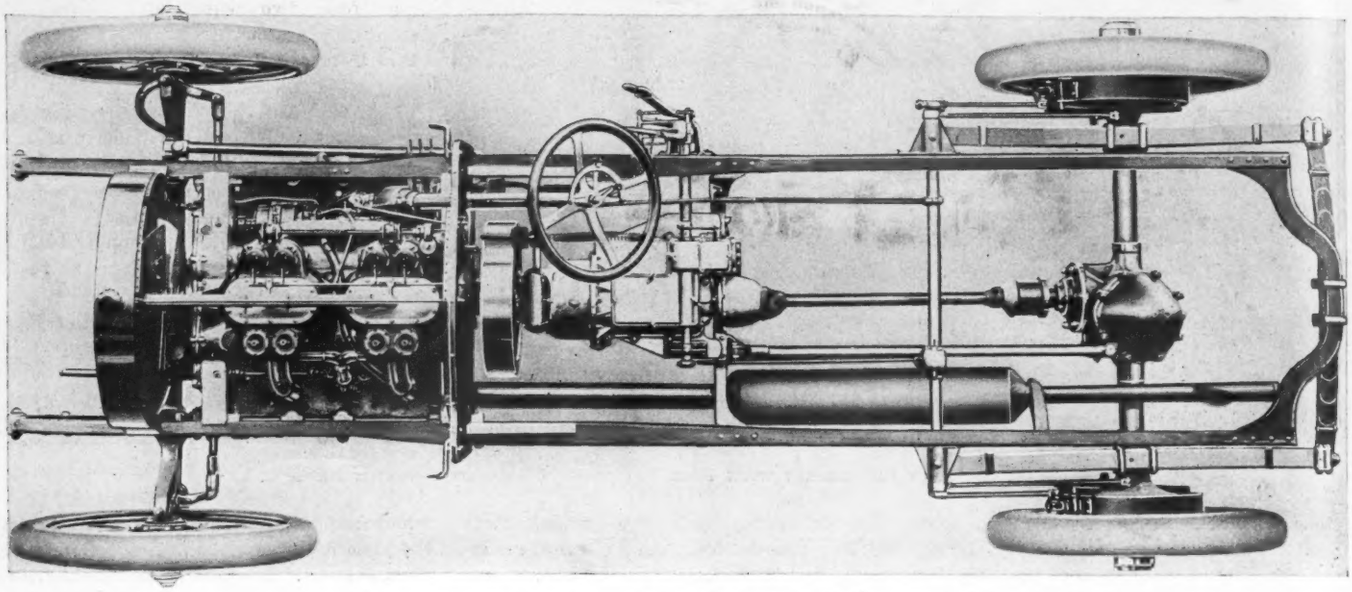


FIG. 1—LOOKING DOWN ON THE CHASSIS OF THE 1910 MODEL RAINIER

THE Rainier Motor Co. has announced its 1910 models, which will consist of four touring models, in addition to which are the two conventional enclosed types, namely, limousine and landaulet. Of chief novelty in the touring types is the semi-torpedo body, in which the open spaces at the ends of the floor boards between the dash and front seat are enclosed at the left by a swinging door, the same affording access to the tonneau. At the right side there is a fixed panel slightly lower than the level of the tonneau door, to allow for greater freedom in using the change speed and emergency brake levers. This body type as viewed from the left side has a uniformly high body side from the dash rearward, the lines of the front seat and tonneau doors being identical. This body has accommodation for seven, five in the tonneau.

The chassis used for all of the models are identical excepting that the one used for the toy tonneau has a few minor alterations. In all, however, are used the 40-horsepower motor with its four-cylinders 5 by 5½ inches bore and stroke respectively. This motor is characterized by the continuation of the low-tension ignition system in which the mechanical members which accomplish the making and breaking of the electric current are mounted on the right side of the motor above the intake valve chambers and driven by shafts and gears from the intake camshaft. These make-and-break parts have been simplified so they offer little difficulty to the dismantling of the motor when such has to be done.

Rainier Improvements

The new Rainier cars carry several improvements, among which can be noted changes in the front axle, which, as illustrated in Fig. 5, is an I-beam forging suitably dropped between the jaw-ending to take the vertical hub of the steering knuckle and the spring seating. The tie-rod is now located in rear of the axle, where it is free from injury and is afforded the protection of the axle itself. The steering arm from the right knuckle is carried above the axle so that the drag bar from the radius arm of the steering gear to this arm is carried well up out of harm's way, in a manner now being widely followed by the leading car builders of the country. The axle has integral seatings on which the semi-elliptic springs rest, being anchored by two clips.

The rear axle, Fig. 2, has been improved so that the differential gears can be removed without further dismantling the axle than shown in the illustration. The cap for the housing is sufficiently large so that the differential gear complete, which is carried on annular ball bearings, can be lifted out of place. Fig. 6, on a following page, shows the axle driveshaft withdrawn from the right half of the axle, showing the construction to be a full floating type in which all of the car weight is taken on the housing, leaving the two driveshafts free to play the single role of rotating the road wheels through the drive imparted to them from the differential gear. These driveshafts are a squared fit at their inner ends into the differential pinions, and at their outer ends carry clutches by which they lock with the road wheel hubs. The rear road wheels have bolted to them the large brake drums, which have been increased for next season. On these drums both sets of brakes operate, one set expanding within them and the other clamping on the drums. As shown in Fig. 1, both sets operate through equalizers, and the design of the rods communicating from the brake pedal and emergency lever shafts is simple, being straight and free from undesirable curves. The final linkages to the brakes are outside of the side members of the frame and are straight and clean-cut.

The Rainier company continues the use of the platform spring in the rear, and in

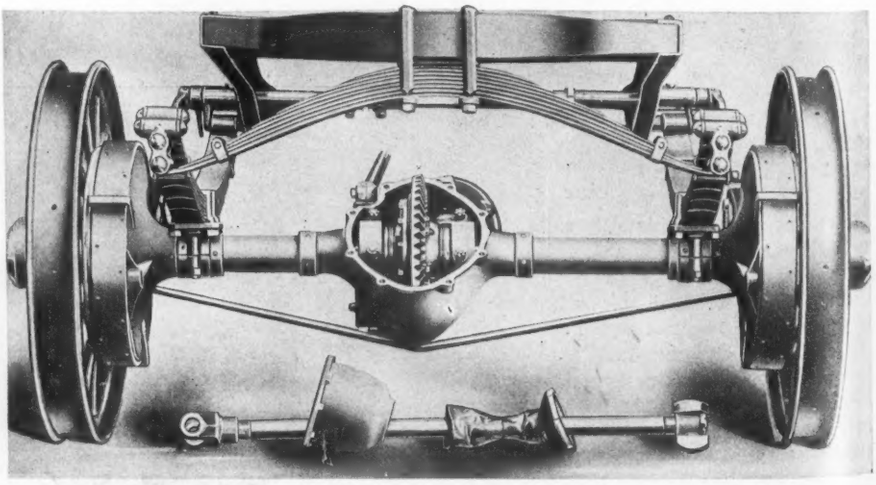


FIG. 2—RAINIER IMPROVED REAR AXLE CONSTRUCTION AND SPRING SUSPENSION

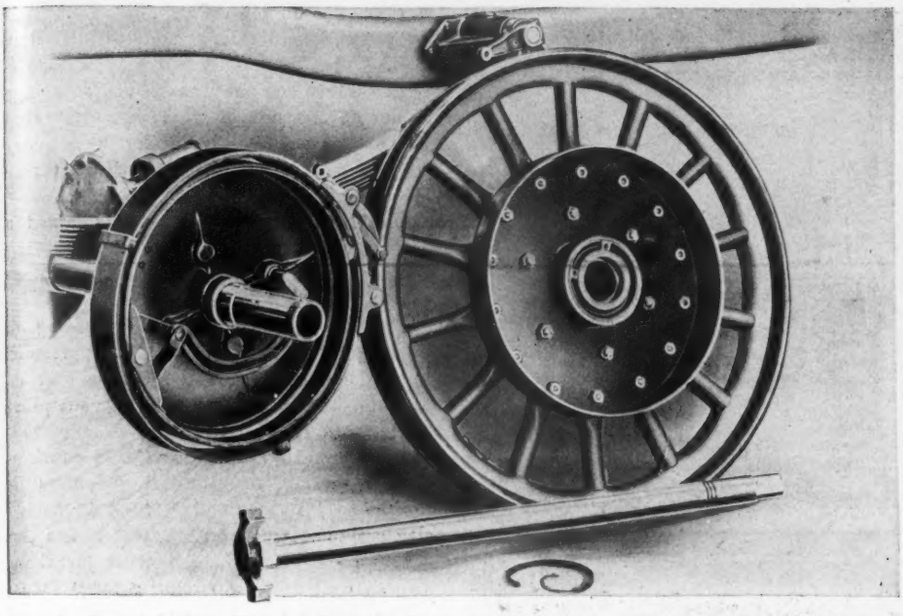


FIG. 3—SHOWING ONE END OF RAINIER FLOATING REAR AXLE, WHEEL AND SHAFT REMOVED

order to make this spring as much of a unit as possible with the frame, the cross member of the latter is curved backward in the center so as to avoid the use of an extension bracket to which the cross member of the spring attaches. This cross piece of the frame is of specially heavy section and is stamped with integral gusset plates where it attaches to the frame side members. The side members seen in Fig. 1 are stoutly designed and have the channel lips gradually widened towards the dash, where there is an offset to lessen the turning angle of the car. As Fig. 3 shows, these members are dropped 2½ inches immediately in front of the rear axle, a construction at present considered standard with the majority of the cars built.

Another Rainier change for next year is shown in Fig. 4, in which the selective gearset and multiple-disk clutch are illustrated. For next year these two parts constitute a unit. Heretofore they have been separate, the clutch being located within the flywheel. Now to the forward end of the gearbox is bolted a skeleton housing in which the clutch is incorporated. To the left of it is shown the complete casting which encloses it and is flanged to bolt to the gearbox. A suitable opening in this housing permits of inspecting or repairing the clutch without dismantling it. One of the objects in having a separate housing for the clutch and another for the gearset, is that a separate lubricant can be used for each, a lubricant specially suited for the needs of each.

The gearset, of the selective type, affords four forward variations, with direct drive on the third speed, the engagement for direct being through dental face teeth on the forward side of the first sliding unit engaging with corresponding parts on the master gear of the set. The gearset design is of the vertical classification, namely, the mainshaft is directly above the countershaft. On this mainshaft with its integral keyways are two sliding sets operated from the shifter rods, which are nested within the gearbox at the right side, where their lubrication is well attended to. On the countershaft in the base of the case the larger gears are bolted to flanges which are integral with the shaft. Both shafts and gears are of nickel steel and are carried on annular ball bearings. The gearbox is cast in halves, the lower part having fanlike side extensions which at the rear form two points of a three-point suspension system.

Two Universal Joints Used

From the gearset a propeller shaft with two universal joints transmits to the rear axle. Paralleling this driveshaft is a V form of torsion rod with the spreading ends embracing the differential housing at the rear and the apex supported in the usual form through a hinge-and-spring support from a cross member of the frame midway of the car.

Although Fig. 6 shows the exhaust or left side of the motor, it fails to give all the features of this power plant. The twin-cylinder castings are copiously water-jacked around the cylinder walls as well as around the valve chambers, which are flat on top and on a level with the cylinder heads, but gracefully taper to where the individual exhaust pipes attach. A clean-cut appearance is lent by the individual housings for the exhaust valve springs, a similar set of housings being furnished for the springs of the intake valves on the opposite side. The motor is a symmetrical group. On the left the water pump, centrally located, is the only part, and on the right are the magneto, at the front, and the carbureter centrally placed.

An improvement in the lubricating system has dispensed with the mechanical lubricator, the oiling system now being a circulating one in which the oil supply is carried in a sub-compartment in the lower part of the crankcase. A gear oil pump elevates the oil to the motor parts whence it overflows, forming a splash in the crankcase compartments proper, into which the connecting rods dip. All overflow from this splash is returned to the sub-compartment or oil reservoir, being well cleansed en route by passing through fine gauze partitions. This oiling system has practically eliminated external piping.

No Special Mud Apron

In designing the casting forming the upper portion of the crankcase, an integral web has been inserted between the motor arms so that the necessity of a special mud

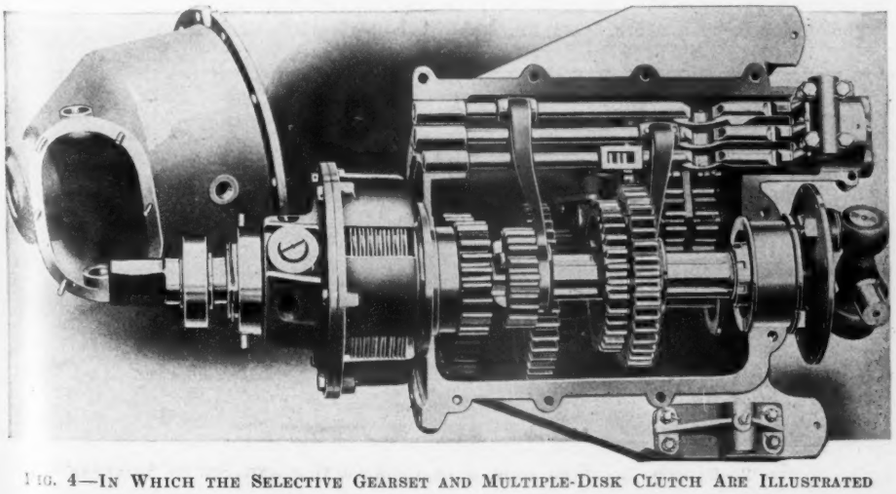


FIG. 4—IN WHICH THE SELECTIVE GEARSET AND MULTIPLE-DISK CLUTCH ARE ILLUSTRATED

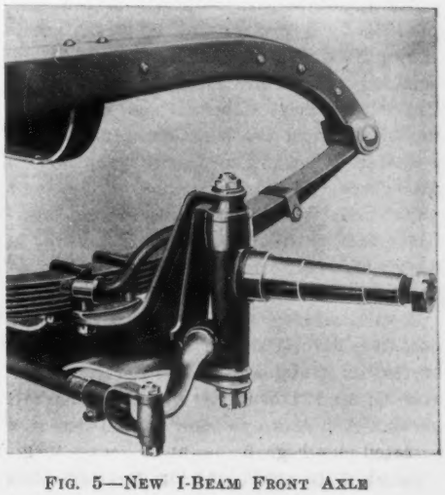


FIG. 5—NEW I-BEAM FRONT AXLE

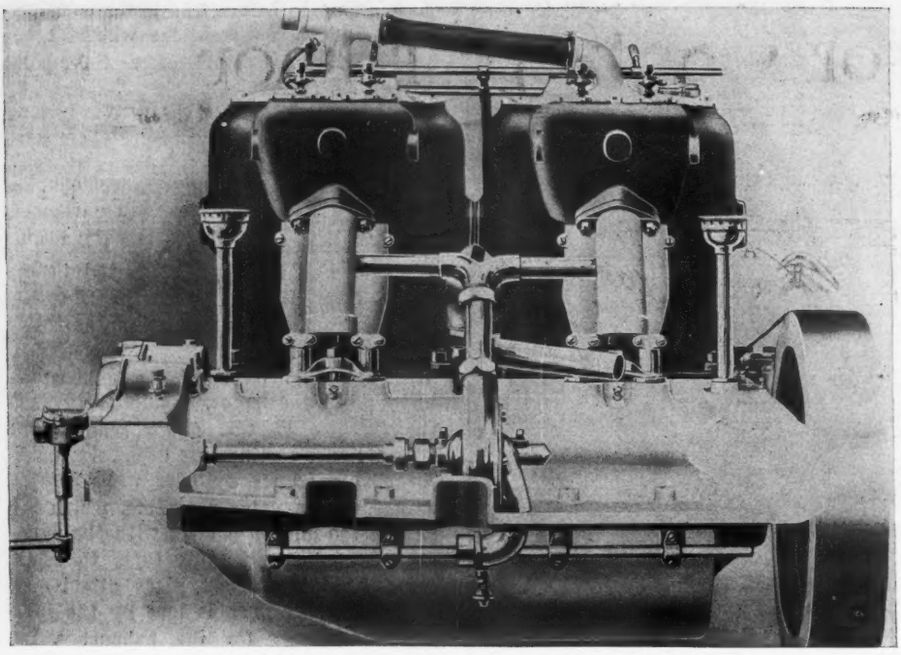


FIG. 6—LEFT OR EXHAUST SIDE OF RAINIER 1910 MOTOR

apron beneath the motor is done away with and plenty of space is afforded for a bed for the magneto.

A conventional forced cooling system is fitted, consisting of a gear-driven bucket-type of centrifugal pump and belt-driven fan. The radiator is of round shape, giving that rounded form to the bonnet which has been a feature by which Ranier cars can be readily recognized.

Both intake and exhaust valves are made interchangeable; the camshaft carries integral cams; the nickel steel crankshaft finds support on three bronze bearings with babbitt facings; connecting rod bearings are of the same type; and the reciprocating masses in the four cylinders are of identical weight, in order to provide perfect balance of the motor.

The wheelbase is 119 inches and the 36-inch wheels carry 4-inch tires in front and 4½-inch sizes in rear. The tread is standard. A worm-and-nut steering gear is fitted.

MOTOR CAR LITERATURE

"Inter-State Motor Cars" is the title of 10½ by 8 size catalog from the Inter-State Automobile Co., Muncie, Ind., describing and illustrating its 1910 products. Three full-page illustrations show its model forty in touring, demi-tonneau and roadster types. The usual specifications are given, as are also the chassis and motor illustrations. A view of the Inter-State factory is also shown. The cover is a two-tone brown affair with the words "Inter-State" in red.

A preliminary announcement from the Streator Motor Car Co., Streator, Ill., illustrates its Halladay models forty, thirty, and G, and the usual specifications are given. A bird's eye view of the Streator factory is shown.

In the 1910 catalog of the Banker Wind Shield Co., besides illustrating the different models of wind shields, enlarged illustrations of the hinges and other parts are included.

The advance information catalog of the Knox company contains car, chassis, motor and other illustrations of the company's line together with complete specifications. Line drawings of the front and rear axles are included. Special illustrations of the unit-power plant of the six-cylinder motor are made use of.

The Auto Improvement Co. has a catalog illustrating all its types of speedometers and combination speedometers and clocks for next year.

The Regal Motor Car Co. has published a booklet containing a complete story of the trip of the Regal Plugger from New York to San Francisco. Fifty-five pages are devoted to the story.

The Atlas Portland Cement Co. has a book entitled, "Concrete Garages," in which the construction of this type of garage is fully illustrated and various types of garages shown in full-page photographic reproductions.

The Paige-Detroit Motor Car Co. has a four-page folder on its 1910 car. This contains specifications and car illustration.

The Gaeth company has issued a 12-page folder on one side of which are illustrated six of its models, including a delivery wagon. On the opposite side are motor illustrations and specifications.

The Thermoid Rubber Co. has issued a folder, effective November 1, containing the consumers' price list of tires and inner tubes.

The Hewitt Motor Co. has a catalog on its 2, 5 and 10-ton trucks. A department in the booklet is devoted to the cost of hauling, the information being compiled by Edward R. Hewitt.

The Packard Motor Car Co. is continuing its method of circulating folders illustrating its commercial truck in active city service. One of the latest shows the 3-ton truck being loaded with merchandise as well as transporting a large safe.

The White Co., Chicago distributor of the White steam and gasoline cars, has started a small booklet known as, "White Products," which will be devoted to the interests of its cars.

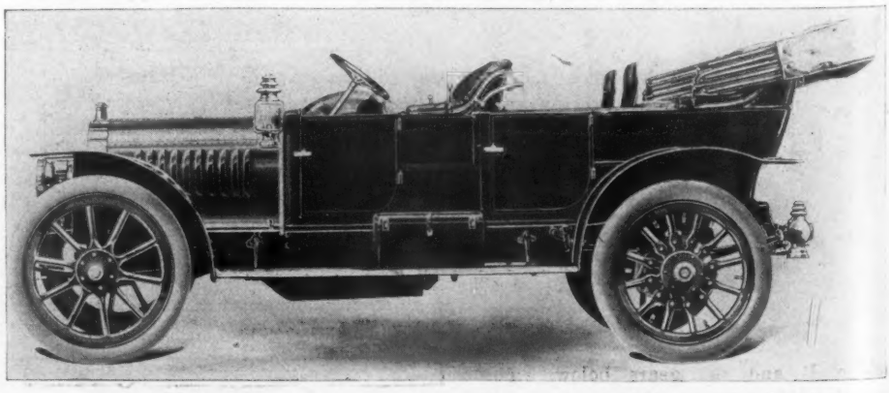
Bulletin No. 12, by the K-W Ignition Co., illustrates the different models of K-W magnetos, as well as K-W spark plugs, coils, master vibrators, and a full line of electric headlights, side lamps and tail lamps. It also includes a complete line of lamps for motor boats. A series of wiring diagrams suitable for lighting cars and wiring 1, 2, 3 and 4-cylinder motors is given.

The Munsey Wheel Co. has a booklet illustrating its Bannister wheels for motor cars, and a price list on these wheels.

The Factory Sales Corporation is distributing a 4-page folder on its pyramid aluminum for floors of motor cars, carriages, motor boats, etc.

The Rolls-Royce, Ltd., London, W. C., England, has issued a book on, "The Cost of Running and Repairing a Motor Car." The information in this is certified to by the Royal Automobile Club.

The Beltzer-Delcamp Welding Co. has a sixteen-page book containing stories on oxy-acetylene welding and cutting apparatus. The different apparatus needed as well as many examples of work done by this process are illustrated.



RAINIER FOR 1910 IN ITS TOURING CAR FORM

The Motor Car Repair Shop

ALTHOUGH some grades of hose are better than others, hose is hose, and all is bound to be short-lived and give unsatisfactory service unless properly cared for. It is no uncommon sight to see, upon passing the wash-rack in the garage, a coil of hose carefully hung upon a nail, as shown at C in Fig. 1, each coil having a sharp bend in it at A and at B. A place for everything and everything in its place is, indeed, good system, but if the place for a coil of water hose is nothing more than a single nail as illustrated, almost any old place flat on the floor is better. If, however, five or six nails were employed, as shown at D, there would be no sharp bends in the hose, and consequently its life would be of greater length. And, better still, if wooden pegs of a larger diameter were employed instead of nails, the results would even be better. Wooden pegs may be made from an old broom-handle, and holes may be drilled of the proper diameter so that the pegs can be driven into them; or, if desired, nails can be used and after they are driven into place their heads can be cut off with a hack-saw; pieces of broom-handle of the required length can then be cut off, a hole of sufficient depth and of a diameter a trifle smaller than that of the nail can then be drilled into one end of the pieces, which may then be driven onto the nails, forming a very good means of protection for the hose.

Timer Trouble and Repair

Among the less common causes of ignition trouble, one often finds most interesting little puzzles which are sometimes very difficult to locate even by the most expert. A short time ago, a well-informed motorist whose knowledge of motor car troubles has been obtained through a long period of practical experience and extensive investigations, and who is now at the head of a prominent school of motoring, was confronted with a case of misfiring which after a systematic but unsuccessful inspection was discovered only by accident. The source of the trouble was the timer of an old motor, an illustration of which is shown in Fig. 2. In going over the motor while it was running, and moving the primary wiring about in search of broken wires or loose connections, etc., the motorist chanced to notice a slight play or lost motion in the timer, and on pressing it to one side with his hand, the missing of the motor ceased. The cause for the missing was then diagnosed as being due to a poor ground connection between the revolving parts of the timer and the engine proper, owing to the lost motion of the worn parts, which consisted of the bushing D and the gears below. The most plausible remedy, then, which presented itself, was a means of insuring a more perfect contact between the revolving portions and a stationary part having good metallic connection with the engine; and perhaps the simplest method of doing this would be to make a spring-blade, bend it over to a V shape, and attach it to the center of the commutator cover as shown at A, so that when the cover is in place the spring-blade will bear upon the end of the shaft of the revolving segment A1. One end of a wire should then be attached to the same screw which holds the blade-spring, and the other end can be made fast to the commutator support as at C, or to the nut at the base of the support H, or in fact to any convenient nut or place of attachment having good metallic contact with the engine or ground wire of the battery. This illustration also gives an opportunity of showing another cause of trouble in an old motor which sometimes is overlooked. As the surfaces of the fiber ring on the inside of a commutator or timer wears down quicker than the metallic segments M, a cut is often taken off this surface to true it up. If too much is taken off, the arm of the lever on the revolving segment, which holds the contact-roller at one end and the tension spring at the other, will bear against the body of the revolving segment, thereby holding the roller away from the inner surface of the timer, or at least causing poor contact, and consequent misfiring. The repairman, knowing that the surfaces are perfectly true and that the timer should be in first-class condition, is liable to look elsewhere for the trouble, which may not be found without a considerable loss of time. The remedy for such a case is to either bend the lever back a trifle, or file a small groove in the body of the revolving segment to give the lever sufficient clearance.

Hints for the Amateur

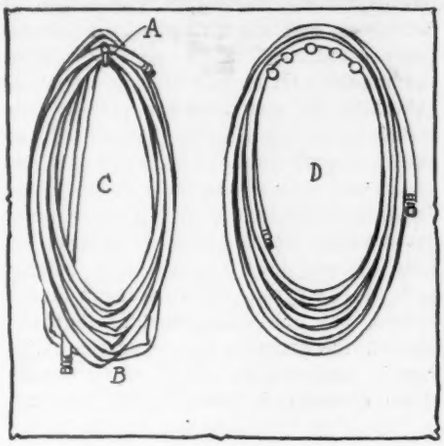


FIG. 1

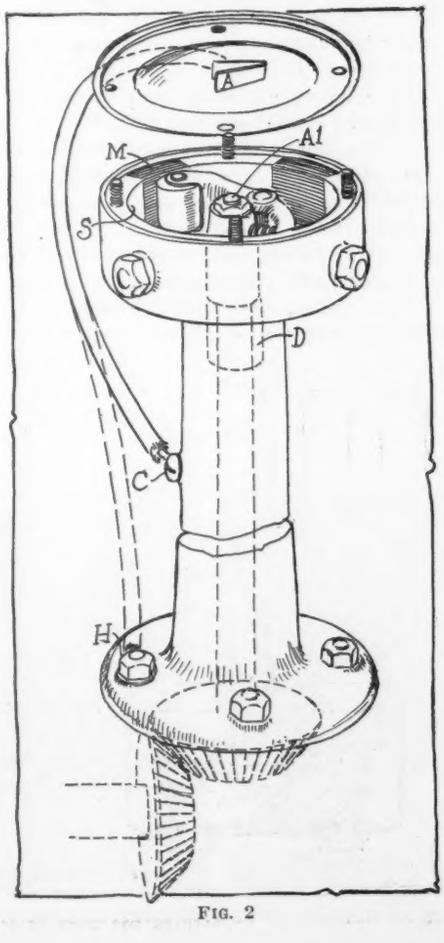


FIG. 2

Use of an Ammeter

The use of an ammeter in connection with a gasoline motor is to show the amount of current which the coil consumes in operation, and to test the condition of dry-cells. A coil should not draw more than .3 to .5 amperes with engine running, and if the motor will not run steadily with this amount of ignition current, either the vibrator or the space between the poles of the spark plugs generally needs adjustment. To insure economic operation, first procure a low-reading ammeter of some standard make that registers not more than 3 or 4 amperes. Next detach the lead wire of the battery, preferably the ground wire, and place the instrument in circuit; that is, one pole of the instrument should be connected to the detached wire and the other to the battery where the wire was attached. Turn on the battery switch and start the engine, and the ammeter will show the amperage the coil is drawing. In placing the instrument in circuit, see that the current throws the needle from left to right. If the needle does not do this, reverse the contacts of the instrument. This also applies in testing dry-cells. Never use an ammeter on a storage battery.

Placing of Exhaust Manifolds

THERE is much discussion at the present time as to the matter of suitable exhaust manifolds for four and six-cylinder engines, just about as much, in fact, as there was a year or so ago on the proper design of the intake manifold. The solution of the intake manifold has, to a large extent, become a settled question, but that of the exhaust is still a much disputed one. The majority of American makers are changing their exhaust manifolds with each new series of cars: one maker announces that he has increased the size of the manifold in order to insure a proper scavenging of the exhaust gases from the combustion chamber and in order to get them away as quickly as possible from the heat of the exhaust valves. In contradistinction to this is another maker who claims it is not necessary to increase the size of the pipes, but to use a small diameter straight pipe leading away from the valve chambers, so that the first discharge of the exhaust gases past the valve and through this piping acts as a piston in the pipe to suck or flow the remainder of the charge through the pipe. If this should be the case it would be impossible to secure such results with a too large exhaust manifold. Andre Roche, writing in Omnia, says:

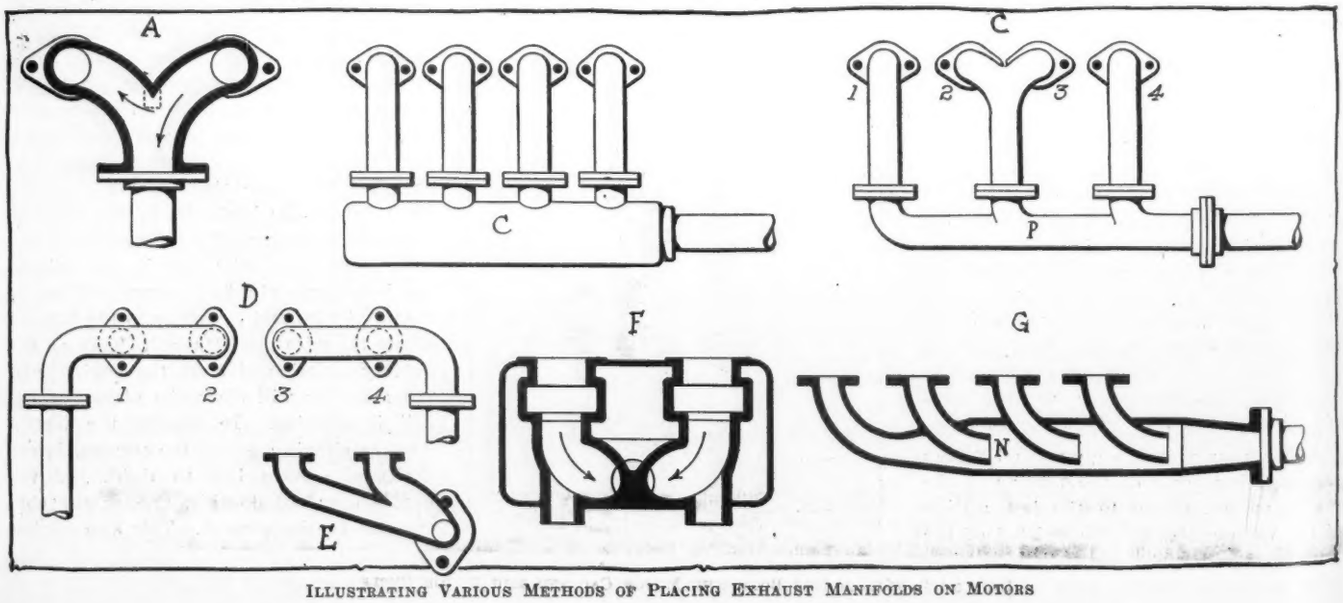
"The disposition of the exhaust manifold on a single or two-cylinder motor presents no difficulties, but on a four-cylinder the problem is more complicated. For four-cylinder work it is necessary to have an exhaust manifold of pipes so that they are least curved and have as large a section as possible; second, so that from one cylinder the exhaust gases shall create no back pressure in another cylinder, the piping must be designed to obviate such. It is not difficult to often fit a satisfactory exhaust manifold in a factory, the main requisite of which is to give very wide and free issue of the gases, but the condition is changed in a chassis on the road with the muffler connected.

Fig. A shows an exhaust manifold for a two-cylinder motor which is much used. In two-cylinder work little difficulty is offered, as the crankshaft throws are at 0 degrees, and when they are at 180 degrees conditions change entirely. When the cranks are at 180 degrees, which is generally the case with the present two-cylinder motor, owing to the ease of balancing the moving part, the two exhaust valves are open at the same time—for 40 degrees, owing to the lead given the exhaust valve, which opens 40 degrees before bottom dead center—at a certain part of the cycle. This in itself is not serious, but one must consider that the moment the pressure in one of the cylinders is exhausted to within a few pounds above atmospheric pressure, the pressure in the other cylinder—the one in which the valve is just about to open—is still high, perhaps 30 or 40 pounds to the square inch, and, although the high-pressure exhaust gases find a wide escape in the big exhaust manifold, a portion of the gas is sure to find its way into the other cylinder, thus reducing the quantity and quality of the fresh gases. There often is in motors of this type a period of 40 degrees during which both valves are open at the same time. It would be impossible to change the opening of one valve so that it would close before the other begins opening, which remedy, however, would be worse. The design of the manifold in the illustration A is, however intended to overcome this trouble.

In examining manifolds for four-cylinder motors the type of crankshaft used is of some importance, and it is understood that the only one considered is that in which the end throws are mounted together and at 180 degrees to the throws of the second and third cylinders. Illustration B shows a simple manifold suitable for a motor of this type, in which is an individual pipe from each cylinder injects directly into the large collector chamber C. In this manifold the collector tube is made sufficiently large so that when the exhaust valve closes the pressure in it is less than that in the cylinder at the valve so that there is no danger of back-pressure. Fig. C shows an arrangement in which the pipes 2 and 3 for the middle cylinders are formed in one, whereas they are separate for cylinders 1 and 4. This works satisfactorily in that cylinders 2 and 3 never explode consecutively, and the one pipe is capable of taking care of the exhaust of the two.

The exhaust manifold illustrated in Fig. D is quite similar to that in Fig. C, excepting in that there are individual pipes for cylinders 1 and 2, and 3 and 4. This is bad construction, in that 4 explodes immediately after 3, and 1 immediately after 2, and we find exhaust gases from 4 will enter 3 and exhaust of 2 will enter 1.

As the direction of exhaust leaving the cylinders is the same it is very easy to make a manifold in which the exhaust pipe, instead of having a tendency to obstruct one another, assist the other cylinders to exhaust. In motors which have their intake and exhaust valves opposite, frequently all four of the exhaust valves are connected through one manifold with a single orifice. Fig. F is one example of an arrangement where it is possible to make the two passages unite. This is suitable for motors with cylinders cast in pairs. The defects of A and D can readily occur in this one if makers were considering loss of power they would not use this one, but they only want to save space. For the best exhaust design, illustration G offers a reasonable solution. In this illustration there is an individual pipe from each cylinder to the large collection. At the end each individual pipe projects into the collector tube and curves in the direction of the exit for this collector tube. In



ILLUSTRATING VARIOUS METHODS OF PLACING EXHAUST MANIFOLDS ON MOTORS

this way the exits N of the individual act as a nozzle and set up an injector action which tends to suck the exhaust gases through the individual pipes. Although it is true that these nozzles offer a certain resistance to the free flow of the gases it also is true that the large collector tube is such as to assist in the exhausting work. In manifolds of this nature the individual pipes from the cylinders should be as long and straight as possible, so that advantage is taken of the rapid expulsion of the gases from the combustion chamber. A quick passage of these gases through the pipe acting as a piston to pull on the remaining gases and thus assists the scavenging. The length of the main tube leading to the muffler is important. It is for this reason that many manufacturers have an extremely small tube or exhaust manifold as far as the muffler, and purposely locate the muffler well to the rear of the car. The exit pipe from the muffler, however, has no bearing on the situation whatever.

It would be very interesting to know by experiment if the actual practice on racing cars where short pipes are fitted that lead horizontally through the bonnet are as good as if a regular manifold as illustrated in G.

NEW-ORLEANS-SAN ANTONIO ROAD

Houston, Tex., Dec. 10—Sam Parks, a millionaire lumber man of Beaumont, Tex., has taken up the matter of a road from New Orleans to San Antonio, and is making progress on the plan. The people of Liberty county have agreed to build an air line through that county, and a survey will be made by government engineers. The commissioners of Harris, on the west of Liberty, and of Jefferson county, on the east, will join with the road work, giving either a shell or macadamized road from Houston to Beaumont. Some portions of the proposed highway have already been built, or, rather, good roads already built can be used as stretches of the highway. The southerners now have the good roads fever and will not be content until they have a network of fine highways that will compare favorably with the best in the country.

In Realm of the Commercial Cars

HOUSTON, Tex., has adopted the motor car and motor cycle for the fire and police departments. The chief of police has a machine which also is used by the detective force; in fact, more by the detective force than by the chief, Chief George Ellis being rather prejudiced in favor of either walking or going on a horse if he must ride. The commissioner of police also has a machine which he uses for city hall business. Fire Chief Ollre has been given a car for his private use. The city has just placed an order for a motor chemical truck and it is to be delivered within the next month.

The United Vehicle Co., a new concern formed recently in Boston, has purchased a big plant at Woodville, Mass., where it will begin operations at once making commercial vehicles of various kinds. The place bought was formerly a big mill and it has all the modern facilities such as electric light, automatic sprinklers, coal sheds, side tracks, etc.

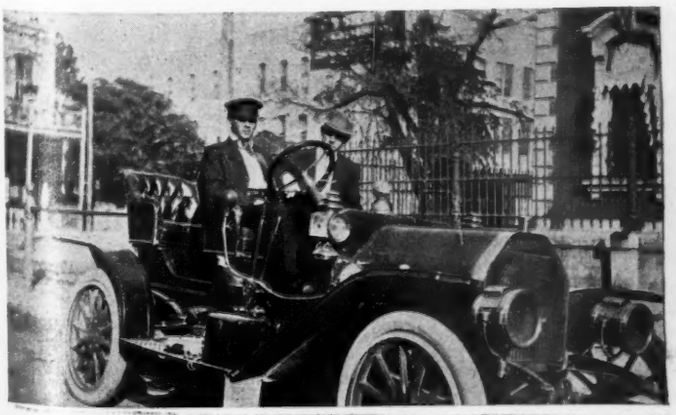
About the most unique outing that has taken place at Worcester, Mass., was conducted by nineteen young women members of the city's smart set, when they boarded one of the R. L. Morgan Co.'s big motor trucks and made a journey of 15 miles to Northboro, where a supper was served and an entertainment given by the young women.

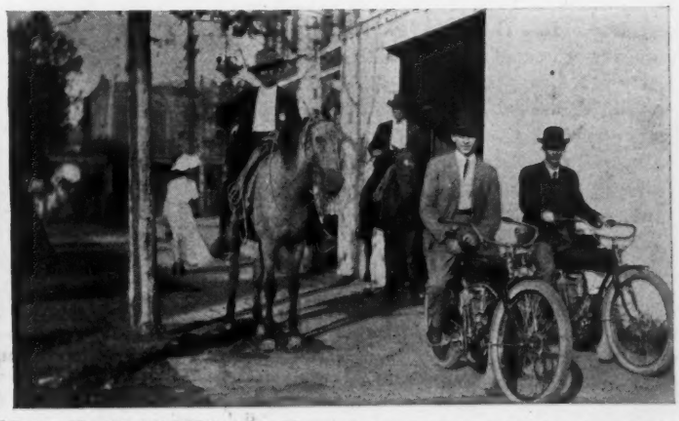
Postmaster H. W. Krumm, of Columbus, O., will not only collect the mail by motor cars after January 1, but he is also arranging to transport the mail to and from the depot and to and from the various substations the same way. In fact, the entire mail service which has been using wagons drawn by horses will be by motor cars after the first of the year. Many bidders among Columbus garages are desirous of furnishing the cars for both the collection and delivery services.

Motor car patrols and police ambulances are slowly but surely displacing the horse-drawn vehicles in Baltimore. The board of estimates has announced that it will allow the police board $5,500 with which to purchase another motor patrol for the northern police district, which is on the extreme outskirts of the city. The new patrol will be similar to the one now in use in the Central district. It is a four-cylinder machine of 60 horsepower. The wheelbase is 148 inches.

The Omaha fire and police board has contracted for the purchase of two Franklin motor patrol wagons. The machines will be specially built with ambulance tops. It will require 90 days at least to turn out the first machine and in the meantime the Franklin company will furnish a pleasure car service in lieu of a patrol wagon. Omaha's last horse patrol went up in smoke 2 weeks ago, when an explosion started a fire which burned the motor patrol and the horse patrol wagon.

An adaption of the commercial motor new in Boston is to be put in operation in a few days by a big lumber company whose yard is across the river in Cambridge. The lumber company intends to use its horse-drawn trucks just as they are at present about the yards. They will be drawn about the lumber yards by horses until a load has been accumulated. Then the front part of the wagon will be jacked up, the horses and front wheels removed, and the motor truck will back into the place of the horses. The front part of the wagon will be lowered, the king bolt slipped into a hole above the rear axle of the motor truck, and the machine will draw away and deliver a 5-ton load at a speed of 5 or 6 miles an hour. By the time it has returned to the yard another wagon load will be ready for delivery, and in this way the truck will be kept constantly at work. It is believed that the delivery can be accomplished cheaper and much more satisfactorily than is possible with horses, and the company will be able to extend materially its field of operations. The truck that is to be used by the Cambridge Lumber Co. is a most interesting affair. Before it was rebuilt for this particular purpose it was a 5-ton standard electric truck made by the Couple-Gear Freight-Wheel Co. of Grand Rapids.





HOUSTON OFFICIALS USE BOTH THE MOTOR CAR AND THE MOTOR CYCLE

THERMO-SYPHON COOLING OF CYLINDERS

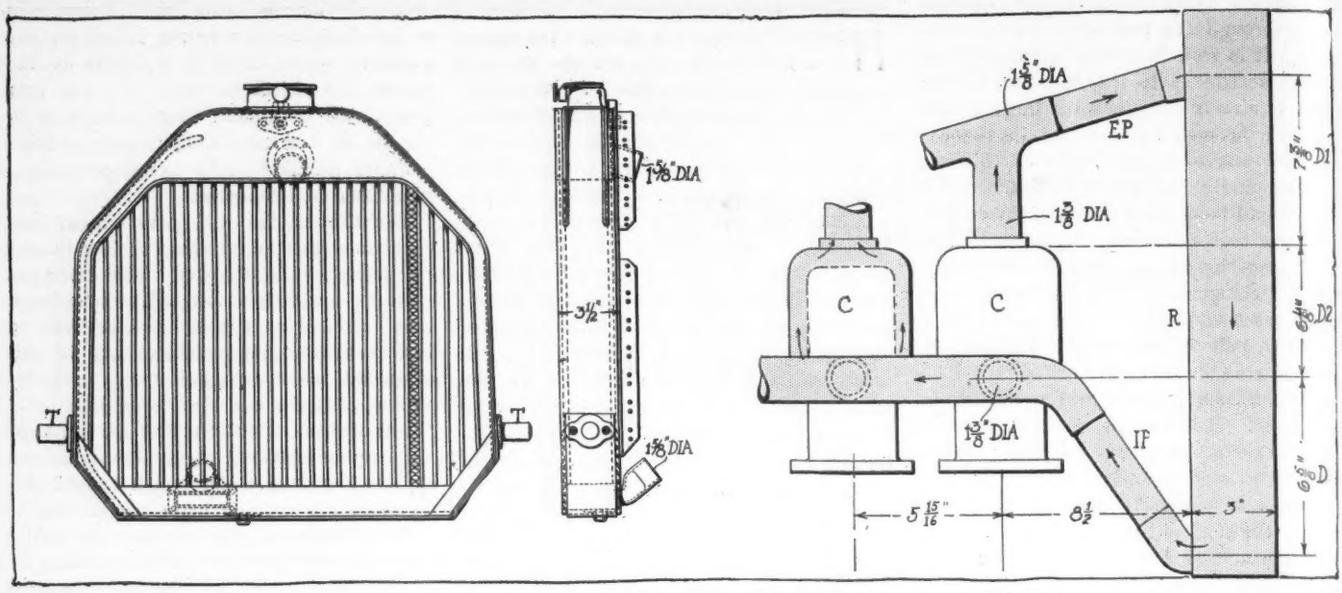


FIG. 1—GENERAL PLAN OF OVERLAND THERMO-SYPHON COOLING AND RADIATOR

THE principal advantage of thermo-syphon circulation for cooling motor car engines lies in its simplicity, since it eliminates the pump and its driving mechanism. This advantage cannot be overlooked at the present state of development of the motor car where every effort is made to reduce the number of parts, and especially the number of moving parts. One of the things which impressed the observer most forcibly in comparing some of the motor cars of 6 or 8 years ago with those of today is the simplicity of the latest models as compared with the older ones. This simplicity tends to make the machine more practical and more fool-proof and therefore commercially more successful. The present-day motor car, instead of being the rich man's plaything, has become a practical everyday necessity; and this result is largely due to the simplicity and the strength of its construction and to the elimination of all possible sources of trouble.

If the pump and its driving mechanism can be left out and thermo-syphon circulation used satisfactorily instead, it would seem to be decidedly a step in the right direction. But the fact remains that the majority of cars, probably the great majority of them, are still equipped with circulating pumps, which indicates that thermo-syphon circulation has not proven universally satisfactory in all respects. Nevertheless, it has great theoretical advantages.

Automatic Flow Regulation

Aside from its simplicity this system also has the peculiar advantage that the rapidity of circulation increases as the temperature of the circulating water rises, so that the demand for cooling automatically regulates the supply in a large measure. As a result of this the engine works at a more uniform temperature, and undoubtedly also, at a higher temperature. These conditions should lead to higher fuel economy. Most engineers agree that the temperature of the cooling water should be high, say from 180 to 200 degrees Fahrenheit for the greatest fuel economy as well as for maximum power. Reports of tests seem to bear out this opinion. Probably the exact temperature for maximum results varies for different motors according to their own particular design, etc.

This self-regulating function of the thermo-syphon system with its tendency towards economy is of greater importance now than formerly. The time was when the main difficulty about motoring was to make the motor go and to keep it going, and so long as it kept on running and nothing broke the motorist might congratulate himself on his good luck and care little whether or not he got 20 miles out of a gallon of gasoline. But those days are past. One seldom sees a motor car stranded by the roadside now except for occasional tire troubles, and since we no longer worry for fear that we may have to be towed home and can feel reasonably sure when we start out for somewhere that we shall not only get there but back again as well, we have more time and inclination to consider the question of economy.

The thermo-syphon system of cooling seems to be theoretically ideal for the two reasons mentioned above, namely, simplicity and automatic regulation; and one wonders why it is not more generally used, although some who have tried it have gone back to the pump; yet it is probably more widely used today than at any former time. The fact that it is not used universally is probably due to the practical difficulties attending its installation and operation. As far as the first cost is concerned, the difference between the two systems is not great. A larger radiator is required for thermo-syphon, also larger water pipes and cylinder jackets, and these extras partly, at least, offset the cost of the pump and drive.

Requires Larger Radiator

The need of a larger radiator results from the fact that thermo-syphon circulation is relatively slow. The result of this slow circulation is that the difference in temperature between the top of the radiator and the bottom is greater than where a pump is used and the water circulated faster, so that the average temperature of the radiator as a whole is lower. The capacity of any given radiator depends upon the difference between the average temperature of the water and that of the air circulating through it; and the greater this temperature difference the greater the amount of heat radiated. A slow thermo-

Overland Thermo-Syphon System

Fig. 1 illustrates the thermo-syphon system used on all of the Overland cars—two cylinders only being illustrated. The water leaves the base of the radiator R and by pipe IF enters the base of the jackets. The entrance to each jacket is 1⅜-inch in diameter. A return pipe ET is made with branches 1⅝-inch in diameter to each jacket. The effective height of this circulating system is $D^2 + D^1$, or 13½ inches. A radiator 3 inches in thickness is used, and from the radiator outlet to the jacket entrances the vertical height is 6⅝ inches. In one of the cylinders the waterjacket space is illustrated, the arrows showing the presumable flow of the water circulation. The two views of the radiator are given, which show the radiator outlet at the bottom and the intake at the top, both 1⅝ inches in diameter. The radiator is supported on trunnions T.

Editor's Note—This article on thermo-syphon cooling of cylinders of internal combustion motors was specially prepared by Joseph E. Lewis, M. E., for Motor Age.

syphon circulation and a correspondingly low average radiator temperature for a given radiator as compared with what it would do if operated by a pump so as to increase the rate of circulation.

. It is sometimes stated that the radiator should be 50 per cent larger for thermo-syphon than for pump circulation, but this seems to the writer to be rather a liberal allowance. It is possible that the radiator would have to be at least 50 per cent larger if the water pipes were not increased in size, but by increasing the diameter of the pipes, the rate of circulation and the quantity of water circulated are increased, and if the pipes were made large enough the volume of circulation by thermo-syphon might even be made to equal that due to the pump, in which case the size of the radiator should remain the same as before. That is to say, the larger the water pipes for thermo-syphon circulation the smaller the radiator necessary.

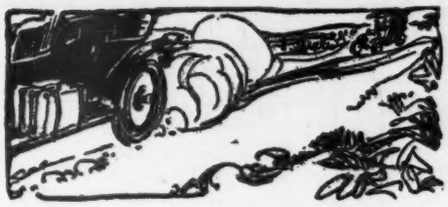
Three Factors Determine Flow

The velocity of flow of the water as well as the quantity circulated by thermo-syphon depends mainly upon three things, namely, the size of the circulating pipes, the average temperature differences between the water in the cylinder jackets and that in the radiator, and the effective height in the circulating system. By the effective height is meant the vertical distance, D2-D1, Fig. 1, between the center of the water inlet 1F to the cylinder jackets at the bottom and the center of the water inlet EP to the radiator at the top. The area of flow through the radiator must also be ample and free, and the waterjackets of the cylinders should be considerably larger than are necessary for pump circulation.

Large water spaces around the cylinders give a free and unobstructed passage which is essential for successful circulation without a pump. They also guard against the formation of steam and the annoyance caused by a hot cylinder. Even if steam does form at times the large volume of water and the free and direct outlet at the top of the jackets prevents it from causing serious trouble such as might result with narrow and crooked outlets. The ideal form of jacketing for thermo-syphon seems to the writer to be found where the cylinders are cast in one unit of two, three or four, as the case may be, with a single waterjacket enveloping all of the cylinders.

Radiator Type Important

The type of radiator used has a direct influence upon the results obtained. Cellular coolers are commonly used, but other things being equal the cooler offering the least resistance to the flow of water is the best adapted for use without a pump. Cross circulation in the radiator is not necessary. The vertical-tube type of tube-and-fin radiator, having fewer and larger water passages, offers less surface friction than the cellular type, in which the passages are extremely narrow and usually crooked. It is therefore the best adapted to the thermo-syphon system since it offers the least resistance to the circulation of the water. The radiator may have only a small bottom water tank, but it should have an ample top tank 3 or 4 inches high at least, and the water inlet should be connected to the top tank as low down as possible, unless it is located on an intermediate tank, as is often done.



The object in locating the water inlet EP as near the bottom of the top tank is to insure its always being below the level of the water surface in the tank because if the water lever were to fall below the inlet circulation would stop. Steaming may sometimes occur, and although it will not necessarily offset the running of the motor provided the jackets are ample and the water pipes large and direct so that the steam may escape as rapidly as formed, it will, nevertheless, result in some loss of water, and if the radiator inlet were not located as low as possible it would soon be above the water surface as the level falls due to the loss from evaporation. If an intermediate tank, Fig. 3, as on Maxwell cars, is built into the radiator several inches below the top tank, and if the water inlet connects with this lower tank, the likelihood of its becoming uncovered is still less. This intermediate tank, however, does not seem to have any other advantage theoretically, whatever its practical advantages may be.

In fact, this very lowering of the water inlet at the top of the radiator, although necessary for the reasons stated above, operates to reduce the efficiency of the system because it reduces the effective height between the center of the inlet at the bottom of the cylinder jackets and that at the top of the radiator. This height should be made as great as possible, which is accomplished by making the radiator as high as will look well, and by locating the engine as low down as possible.

Good for Horizontal Motors

In this respect the horizontal opposed motor lends itself admirably to the system. The motor should in any case be located as near the radiator as possible so that the water piping may be short and direct. Thermo-syphon circulation with the motor under the body and the radiator up in front of the hood is well nigh impossible, principally because of the long and crooked piping necessary to connect up the system. It is very essential that the pipe connecting the top of

Overland Waterjackets

In Fig. 2, which is a side section of the four-cylinder Overland motor with complete cooling system and water circulation, is emphasized by the benday tint. It can be noted that the water spaces appear in the second and third cylinders. The second cylinder shows particularly the copious water spaces around the valves. This motor, like the Maxwell, has separately cast cylinders, whereas with the Renault, illustrated in Fig. 4 and which was the pioneer in thermo-syphon cooling, the cylinders are cast in pairs. Mr. Lewis in the accompanying article takes the stand that en bloc, or casting all four cylinders in one, is most satisfactory for thermo-syphon circulation. It is customary to employ the fan to assist air circulation through the radiator. This complete system is illustrated in Fig. 2. A fan is used on the Maxwell, also illustrated, but in the Renault the flywheel of the motor is depended on to create the air current through the radiator.

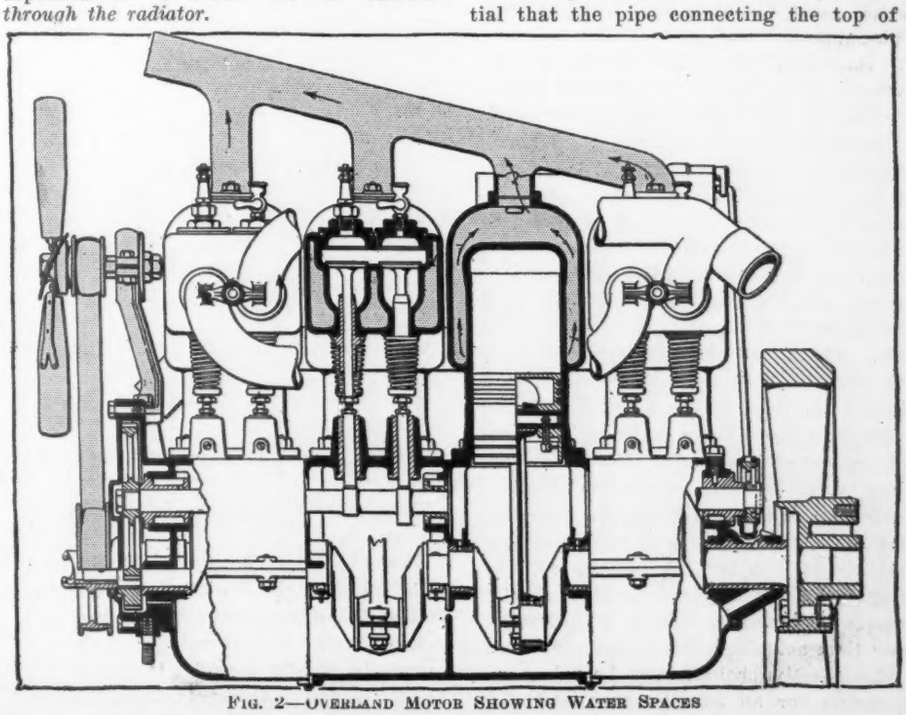


FIG. 2—OVERLAND MOTOR SHOWING WATER SPACES

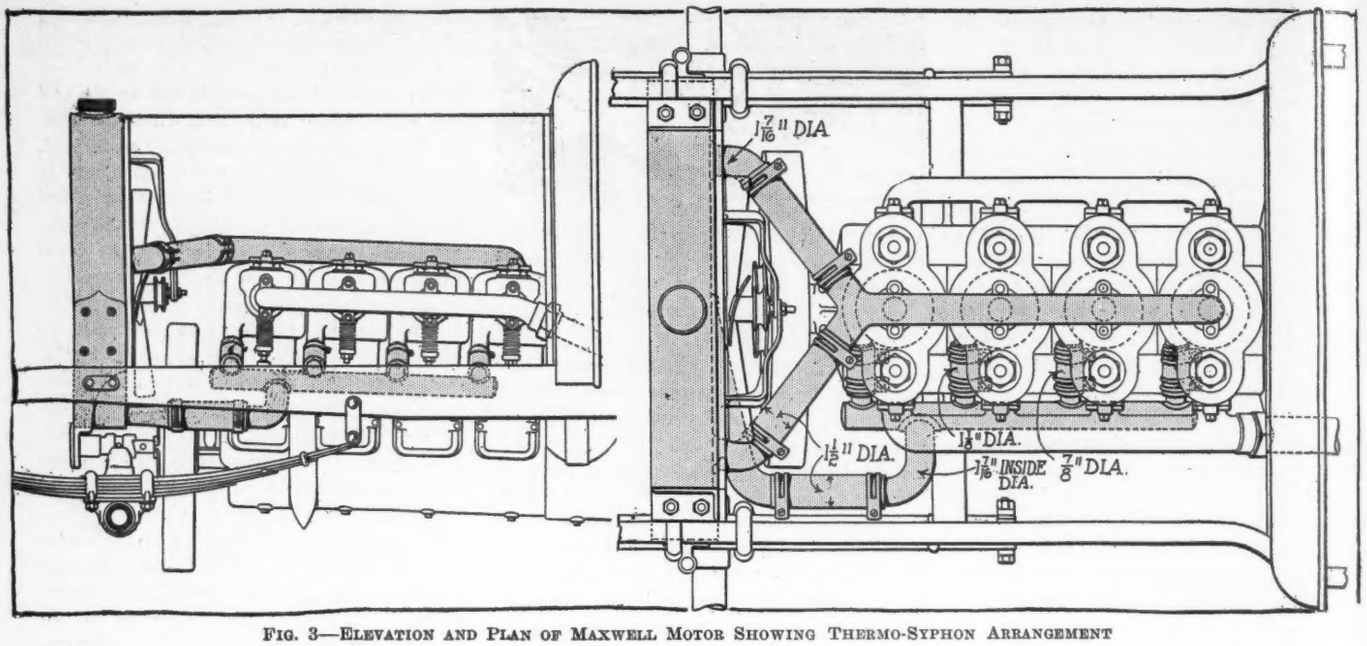


FIG. 3—ELEVATION AND PLAN OF MAXWELL MOTOR SHOWING THERMO-SYPHON ARRANGEMENT

the cylinder jacket with the top of the radiator should be as nearly a straight line as possible. See in the present Overland system, Fig. 1. The bottom connections do not make so much difference although curves and elbows should be avoided so far as possible since they offer considerable resistance to the flow of water.

We have stated that the velocity as well as the quantity of water circulated depends principally upon the size of the pipes, the temperature difference and the effective height. It will be interesting, in the absence of experimental data, to figure out theoretically the velocity and quantity of water circulated under a given set of thermo-syphon conditions. We will assume the temperature to be 200 degrees Fahrenheit at the top of the radiator and 170 degrees Fahrenheit at the bottom, which gives an average of 185 degrees Fahrenheit for the water in the radiator. It, therefore, enters the bottom of the cylinder jacket at 170 degrees and leaves the top at 200 degrees or a trifle more. This would seem to indicate an average temperature of 185 degrees for the water in the cylinder jackets. But it must be borne in mind that the flow of water is induced by the difference in weight between the water in the two sides of the system, the radiator being one side and the jackets and outlet pipes the other side. If the average temperatures are the same on both sides there will be no circulation. Hence it is evident that the average in the radiator must be less than 185 degrees or else that in the jackets and pipes must be more than 185 degrees Fahrenheit. It is difficult to estimate just what this temperature difference amounts to, but for the purpose of this computation we may assume it to be 10 degrees Fahrenheit, which is probably more than actually exists rather than less.

The effective height may be taken as 20 inches for an average case, and the total length of the circuit which the water travels is 5 feet. We will assume that the resistance to flow in the radiator and jackets is at least no greater than that in the pipe connections. Under these conditions we may figure aproximately the velocity and quantity of circulation for water pipes of different sizes, using the hydraulic formula for the flow of water in metal pipes, which is as follows:

$$V = C \times \sqrt{\frac{D}{4}} \times \sqrt{\frac{H}{L}}$$

Where V = Velocity of flow in feet per second.

Where D = Inside diameter of pipe expressed in feet.

Where H = Hydraulic head expressed in feet.

Where C = A constant determined by experiment.

Where L = Total length of pipe in feet.

The value of H depends upon the difference in weight between the two columns of water 20 inches high. This difference in weight may be computed for the 10 degree Fahrenheit difference in temperature at about 190 degrees Fahrenheit to be .0024 pounds, which is the pressure per square inch in the system tending to produce a flow of water and is equal to a hydraulic head H of $2.309 \times .0024 = .0055$ feet.

For 1-inch pipe—approximately 1-inch inside diameter—the value of C is 47.1

and that of $\sqrt{\frac{O}{4}} = .144$

$$\sqrt{\frac{H}{L}} = \sqrt{\frac{.0055}{5}} = \sqrt{.0011} = .033$$

Therefore $V = 47.1 \times .144 \times .033 = .224$ feet per second
= 13.4 feet per minute
= .546 gallons per minute
= 4.55 pounds per minute
= 136 B. T. U. per minute, this last being the total heat radiated by the radiator.

For 2-inch pipe the value of C is 61.5

and that of $\sqrt{\frac{D}{4}}$ is .204, and that of $\sqrt{\frac{H}{L}}$ is the same as before, .033.

Therefore $V = 61.5 \times .204 \times .033 = .414$ feet per second
= 24.8 feet per minute
= 4.004 gallons per minute
= 33.37 pounds per minute
= 101 B. T. U. per minute.

For 3-inch pipe the value of C is 70 and that of $\sqrt{\frac{D}{4}}$ is .251, that of $\sqrt{\frac{H}{L}}$ being .033 as before. Therefore $V = 70 \times .251 \times .033 = 0.580$ feet per second
= 34.8 feet per minute
= 12.7 gallons per minute
= 105.8 pounds per minute
= 3174 B. T. U. per minute.

If these figures are anywhere nearly correct, and we are inclined to believe that they are approximately so, they show conclusively the necessity for large water pipes for thermo-syphon circulation. It will be observed by comparing the results

Maxwell Thermo-Syphon System

In Fig. 3 is illustrated the thermo-syphon system of water-cooling used on Maxwell four-cylinder cars. The water system is emphasized by a benday tint thrown over the radiator, the intake pipe to the bottom of the jackets and the return pipe from the tops of the jackets to the radiator. The left half of the illustration shows how this return pipe enters the radiator midway of its height, and the right half shows the scheme of branching of this pipe, one branch going to the right side and another to the left side of the radiator. The intake pipe diameters are 1⅞-inch inside measurement, whereas the return pipe has a measure of 1 7/16-inch and 1½-inch at the hose connections. The intake pipe is a manifold with a right-angled branch to each jacket. The return piping is comparatively straight. The Maxwell radiator has the intermediate tank construction of which Mr. Lewis speaks.

Asks $300,00 Road Fund

Milwaukee, Wis., Dec. 13—The law proposed by the legislative committee of Wisconsin provides for an annual appropriation by the state of $300,000 for highway improvement. This sum is to be divided into three parts. Five per cent will be deducted each year for a repair fund. The state highway commission will receive $25,000 for expenses. The remainder will be apportioned by counties. All roads for which state aid is asked must be 24 feet wide from ditch to ditch with a 15-inch crown. A salaried board of three men, one a civil engineer, is provided for, with terms of 2, 4 and 6 years and thereafter each to serve 6 years. The governor will have the appointing power. Roads may be built of dirt, gravel or macadam or materials approved by the commission. The initiative will be with the towns. The county must meet the town with an equal amount, not to exceed $2,000 in any one year, and when the road is completed the state will pay one-third the cost.

for 1-inch and 2-inch pipe that although the area is only four times as great in the 2-inch pipe as in the 1-inch, the rate of circulation, or rather the quantity of water circulated, is nearly eight times as great. This seems to bear out the statement previously made that it is possible and practicable to make the pipes sufficiently large so as to produce a volume of circulation by thermo-syphon equal to that ordinarily produced by the pump.

Inch Pipe Too Small

Apparently 1-inch pipe is too small for even a small motor, and the sizes should range from 2 inches to 3 inches in order to give good results without an excessively large radiator. Apparently, also, the best results will be obtained when the highest point of the cylinder jackets is considerably below the top tank of the radiator. When this condition exists the water pipe from the top of the jacket to the top of the radiator becomes a water column containing the hottest water in the system, and the greater the vertical height of this column the greater the average temperature difference tending to cause circulation. The same thing is true in regard to the relative heights of the bottom of the radiator and the lowest point of the waterjacket. The lower down the bottom of the jacket as compared with the radiator the better. If the water could be heated at the lowest point of the engine side of the system and cooled at the highest point of the radiator side, the remaining difference in height being made up by the connecting pipes the ideal arrangement for thermo-syphon circulation would be realized.

The Renault System

Fig. 4 illustrates generally the layout of the thermo-syphon system employed on a four-cylinder Renault car. The Renault company occupies the premier position in thermo-syphon cooling, it having been the great exponent of this in all of its touring and racing types. The Renault system differs from practically all others in that the radiator R is located back of the motor, and an air-tight bonnet A and mud apron B combination is used, so that the flywheel F creates an air circulation, the air being drawn through the radiator as illustrated by arrows E in the right half of the illustration. This air then circulates within the bonnet and around the four cylinders. Curved deflecting plates F are inserted in the corners back of the radiator so as to assist in directing the air currents E. The intake pipes P on Renault cars are of very large diameter tubes and enter the lowest points in the jackets. The return pipe X is of large diameter. The Renault water pipes are characterized by their freedom from sharp curves. On these cars a large type of vertical tube radiator is used and the water capacity of the cooling system in the larger sizes is particularly great. The fact that patents have been held on this system of cooling, in which the radiator is located at the dash, has had an important bearing on many car makers, and now that the patents have become inactive several European makers have brought out cars with motors cooled after the Renault principle.

Eastern Drivers Welcome

San Francisco, Cal., Dec. 9—A statement in the eastern motor press to the effect that California has a general ban on eastern racing drivers has drawn out a strong denial here. The statement is credited to a southern California motorist, but it does not find an echo in this part of the state. A writer in one of the leading daily papers says: "San Francisco's greatest complaint is that she has had too little opportunity to see the great eastern drivers. The men who are at the head of the list of great drivers have been kept so busy on the eastern and middle western circuits that virtually none of them has found time to get out to this coast, and this situation will continue as long as the conditions of utter disorganization among the local motorists continues. To the writer it appears foolish to say that there is a ban on eastern drivers in this state. Before talking about a ban it would be interesting to see a few of the drivers showing an inclination to come this way. So far as northern California enthusiasts are concerned, it is safe to say that the crack easterners would be welcome with open arms. The work of Californians on eastern tracks and the records we have put up on our own tracks indicate that there is no reason why we should not greet the easterner with enthusiasm for the added interest that he can give to the contest. Let them all come along."

THINK MOTORISTS MILLIONAIRES

The county board of supervisors of Waukesha, Wis., has adopted a resolution instructing its representatives in the Wisconsin legislature to use their best efforts to enact a law providing that all persons owning motor cars and running them on public highways be required to pay $50 a year into the good roads fund. This board is composed mainly of farmers. The representation of the only real city in Waukesha county, Waukesha, is small and the vote was overwhelming.

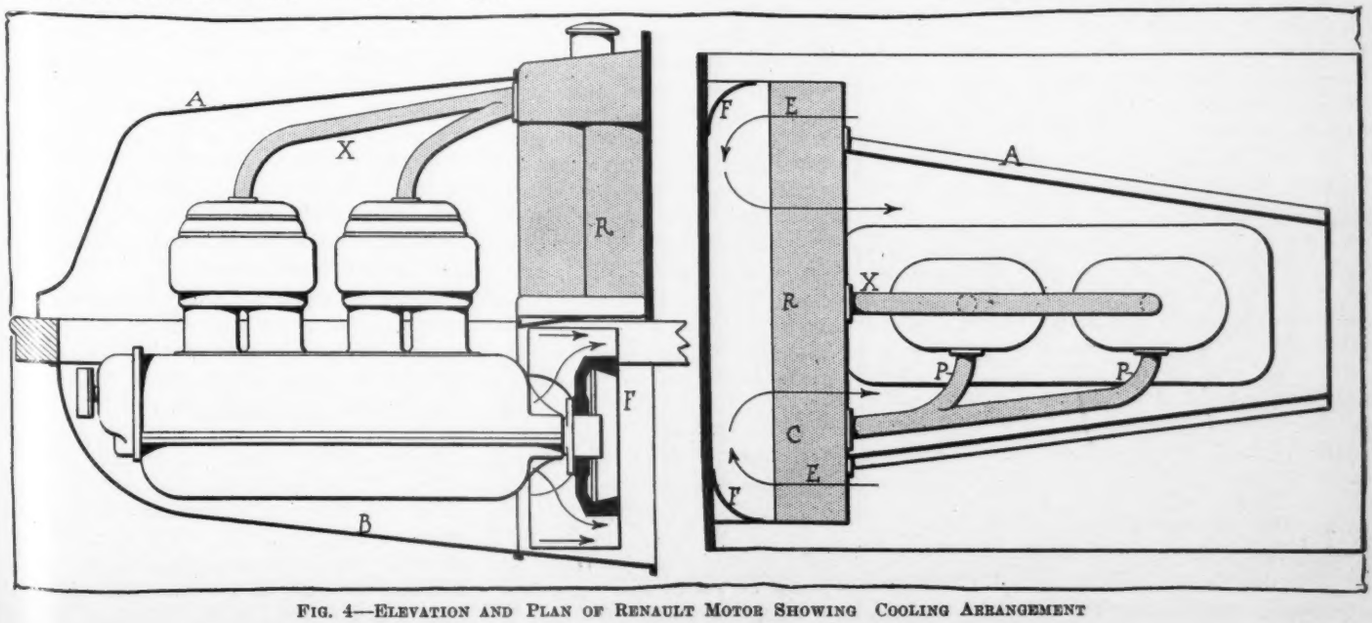


FIG. 4—ELEVATION AND PLAN OF RENAULT MOTOR SHOWING COOLING ARRANGEMENT

From the Four Winds

STUDEBAKER OWNERS AT DAYTON AND SPRINGFIELD, O., FORM CLUB AND ENJOY A TOUR

Ohio Registration—The Ohio state motor department issued exactly 23,000 car licenses for the year 1909. The 23,000th set of tags was issued Saturday to Miss W. L. Ferrin, of Cincinnati.

Toledo Show in March—It is probable the annual show of the Toledo Automobile Dealers' Association will be held some time the latter part of March. A meeting of the board of directors was held last week for the purpose of selecting a successor for Secretary Fisk, who recently resigned on account of removal to Cleveland. A. W. Norris was chosen to fill the vacany and Louis Lichtie was made a director of the board.

Spokane Starts Chauffeurs' Club—The drivers of Spokane, Wash., have recently organized under the name of the Spokane Chauffeurs' Club, the following officers being elected: Tom C. Evans, president; John A. Halstead, treasurer; Harry R. Anderson, secretary. The charter members of the club are all experienced drivers. It was determined at the meeting that only men who have had at least 2 years' road experience as drivers and can pass a rigid technical examination are eligible as members of the club.

Making It a Big Affair—The banquet committee of the Quaker City Motor Club, now that the New Year's run has been abandoned, is working to make that affair the event par excellence of the club's social season. Among the better known notables who will have something to say to the banqueters are Governor Stewart, United States Senator Penrose, Congressman Moore, Mayor Reyburn, Mayor Stoy, of Atlantic City, State Senator Webster Grim, the directors of the city departments of public safety, health and wharves, Messrs. Clay, Neff and Hasskarl; Messrs. Hazlett and McCurdy, presidents of select and common councils, respectively; several motorists who are prominent nationally, with a few managing editors of local and out-of-town papers to add weight to the line-up.

Norwich in Line—The Chenango Motor Association has been organized at Norwich, N. Y., and the following officers elected: President, H. R. Follett; vice-president, F. S. Powell; treasurer, H. G. Mahan, and secretary, C. H. Latham.

All Space Sold—A force of men will start at work this week to decorate the Auditorium at Columbus, O., for the motor show to be held under the auspices of the Columbus Automobile Club, December 25 to January 1. Nine miles of bunting will be required to cover the entire interior of the building. Hundreds of American Beauty roses will also be used in the decorations. Every square foot of space has been sold and a number of applications for space had to be turned down.

Test for Slow Driving—A prize recently was offered by H. T. D. Wilson, Houston, Tex., to the car that would make ¼-mile on high gear at the slowest rate of speed. By the rules of this contest the drivers were compelled to use the high gear throughout the race. Four cars entered. Two were disqualified, being unable to travel this distance on high gear at such a low rate of speed without killing the engine. The Rambler won the event, consuming 4 minutes 35 seconds of time.

Helping the Farmers—William Glatz, president of the Oshkosh Brewing Co. and Oshkosh Pure Ice Co., Oshkosh, Wis., has offered to give $200 if motor car owners and residents of Oshkosh give $2,500, to pay for improving Doty street, a residence thoroughfare, from Sixteenth to Twenty-fifth streets. Mr. Glatz also urges general improvement of highways in and leading to the city, believing that it will bring farmers to the stores and also reduce the prices of grains and vegetables which they bring for trade. He says it also will set a good example for the farmers to go and do likewise in improving roads.

Missouri After State Body—W. W. Cowen, president of the Automobile Club of Kansas City, has been in correspondence with Samuel D. Capen, president of the St. Louis Automobile Club, with a view toward the organization of a Missouri state motor association.

Rubbernecks on a Tour—Two large sightseeing passenger motor cars passed through Nashville a few days ago on their way to Florida, where they are to be delivered. The cars were from the plant of the Rapid Sight-seeing Automobile Co. and were 3 weeks in making the trip from Traverse City, Mich., to Nashville. Many stops were made on the way and the machines exhibited. E. A. Hubbard and a party of six were making the trip.

Winter Motoring Popular—Winter motoring is more popular than ever before in St. Louis. This fact is shown conclusively by the fact that the applications at the big garages for the storage of cars through the winter are not nearly so great as at this time last season. This notwithstanding there are more than 1,000 more cars in operation than was the case a year ago. Limousines are being used in greater numbers than ever before at this season of the year in the Mound City.

Everyone Helping—Work on the macadamizing of the bit of road which will enable tourists to sidestep a particularly bad bit of going on the route between Philadelphia and Allentown, and incidentally result in a saving of 30 cents per car, is rapidly nearing completion. The expense of the work, which is being done under the direction of the roadmaster of Hilltown township, will be met by a fund raised by the good roads committee of the Automobile Club of Philadelphia, which passed around the hat and raised a suffi-

cient amount to start the work, relying upon the generosity of motorists generally to help out the good work.

Cars Are Necessary—The building of two dams across the Missouri river at Helena, Mont., is a 2-year job begun by the Stone & Webster Engineering Corporation, of Boston. How the methods of older and more advanced communities are transplanted in the execution of distant contracts of this nature is shown in one of the company's first acts after beginning work, namely, the putting of a Franklin motor car into service. It was found that a car was necessary for quick transportation along the field of operation.

Dealers Running Show—An official announcement of the purposes of the show to be held at the Broadway Arsenal, Buffalo, the week of February 14, has been made. The exhibition will be managed by the Buffalo Automobile Trade Association and will be under the auspices of the Automobile Club of Buffalo. All the profits of the week will be donated to the club and will be spent on the agitation of various projects, including the proposed Niagara Falls boulevard, improved highways and the erection of signboards.

Coloradoans Building Roads—Vigorous activity in road-building is promised by the commissioners of Boulder county, Colorado, with the beginning of the new year. Commissioner Clark Gilbert, in his district, will macadamize the roads leading to the coal camps from the valley road running east from Boulder, which is now graveled for about 8 miles, thus making a first-class driveway from both Louisville and Lafayette into Boulder. Seven miles of road will be dressed with this material in that part of the country during the winter.

Indians Buying Cars—Congressman Charles E. Crieger, now representing a congressional district of Oklahoma in the national house of representatives, while in Columbus recently told of the great market for motor cars which has been opened among the Indian tribes of the west. The Indians who have sold their government lands are easily induced to purchase cars, which are rapidly displacing ponies. As the Indians are not good machinists as soon as the motor cars are out of repair they find their way to the junk pile, the congressman says.

Fighting Dealers Go to Law—The squabble between the Kansas City Automobile Dealers' Association and the newly formed Motor Car Trade Association over the promotion of two motor shows in Kansas City, Mo., has resulted in litigation. An injunction has been asked for and temporarily granted by Judge Park of the circuit court to the old association, restraining the Motor Car Trade Association from circulating posters, window cards or other advertising matter labelled "Annual Motor Car Show," and relating to the exhibition being prepared for by the month-old organization. The Kansas City Automobile Dealers' Association asserted in its petition that the use of the word "annual" in connection with advertisements of the new association's show was intended to deceive.

Quaker Election—The Philadelphia Automobile Trade Association has elected the following officers: President, J. A. Wister; H. B. Lazelere, vice-president, and W. F. Foss, treasurer.

Present for Hower—A chest of silver, the gift of the American Automobile Association, was recently presented at the Automobile Club of Buffalo to Frank B. Hower, retiring chairman of the contest board of the association. The presentation speech was made by George C. Diehl, a member of the executive committee of that organization and chairman on good roads of the national body.

Seeks Club Quarters—The Louisville Automobile Club, of Louisville, Ky., having been forced out of its present quarters in the Louisville hotel, has scoured the city for new quarters. Several locations have been selected by a special committee, and a meeting of the club members will be held early next week to make a final selection. The new quarters will be located in the heart of the business center, and probably on Fourth avenue. The club has had headquarters at the Louisville hotel for several years, but recently the management of the hotel began extensive improvements.

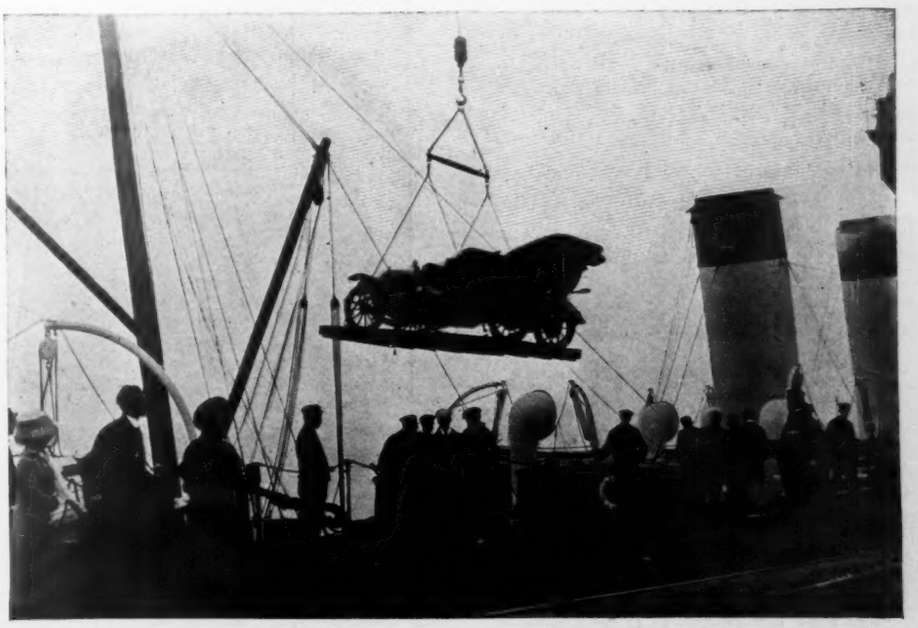
Want Drivers Examined—The October grand jury, of St. Louis, Mo., which has been discharged by Judge Hugo Grimm, in its complete report recommends that all chauffeurs, before they are permitted to operate motor cars, be examined by a competent board both as to brains and physique. The report advocates a system of licensing drivers by a board of examiners created either by the authority of the state or the city, none except such as hold such licenses to be permitted to operate motor cars within the city. Chauffeurs' licenses, the report declares, should be revoked for drunkenness, recklessness, or the unauthorized use of another person's car.

Studebaker Club Formed—Twelve recent purchasers of Studebaker E-M-F cars located at Dayton and Springfield, O., organized a Studebaker club and make their first week-end run to Columbus, O.

Ships Car by Boat—An accompanying illustration shows the six-cylinder 48-horsepower Pierce-Arrow car owned by Bernard G. Gunther, of New York, being hoisted on board a channel steamer for shipment from England to France. Mr. Gunther toured extensively in Europe during the summer.

Boom New Orleans Meet—All doubt of New Orleans having its 1910 Mardi Gras track meet was dispelled at a meeting of hotel men of this city, when all agreed that New Orleans needed the races and should have them. Consequently they agreed to coöperate with the New Orleans Automobile Club in pulling off the meet. Purses, prizes and trophies of all kinds will be offered by the hotel men and it is planned to make the 3-day meet of February 4, 5 and 6 the best ever held in the city. The races will be held on the fairgrounds mile track.

Favor a Country Home—By a postal card vote a majority of half of the members of the Automobile Club of Kansas City are in favor of retaining the 40-acre country site for a club house, in preference to a rest home in the immediate outskirts of the city or club rooms and a garage downtown. The 40 acres near Hickman's Mills, about 20 miles from the heart of the city, lays well for club grounds and even golf links. So many of the 460 members of the club belong to downtown clubs that it is thought this was the reason why the downtown proposition was rejected.



B. G. Gunther's Pierce-Arrow Preparing for Trip Across English Channel

MAKING THE MOTOR START ON COMPRESSION

By M. R. Wells

TO be able to start his motor on the spark is one of the desires of every driver of a motor car and in any of the many cases where he cannot the motor is usually blamed for the trouble. In most cases where anything goes wrong about the motor, the driver or owner is most prone to lay it to something about the ignition, yet in the case under discussion it seems that the opposite is true and the motor is always blamed whether it be at fault or not.

A discussion of a few of the essentials for self-starting may lead some of the readers to look further into the conditions existing on their cars with the result that they will no longer be content to belong to the cranky set of drivers.

Studying the Motor

Let us first assume that a four-cylinder, vertical, four-cycle motor is under discussion, and determine in what position the motor will naturally come to rest after the ignition has been cut off. Taking the cylinders in the order of firing, we find that No. 1 is filled with an explosive mixture—unexploded because of current being off—and the piston is going out or down; No. 2 cylinder—whose crank is opposite to No. 1—is also filled with an explosive mixture and the piston is going in or up. Except at the bottom of the strokes, the above cylinders are supposed to be gastight since their valves are all closed. No. 3 cylinder is being filled with mixture, the piston is going out or down and the inlet valve is open; and No. 4 cylinder is exhausting its contents, the piston is going up and the exhaust valve is open. We thus find that at any time two cylinders are open to the atmosphere and consequently under practically no pressure; whereas the other two cylinders are closed and each contains the same amount of gas that the other does. For the last reason, the pressures in them will be equal when the pistons are the same distance from the top—assuming equal clearances, etc. Since the cranks for these two cylinders are opposite, this condition exists only when the cranks are at right angles to the axis of the cylinders and both pistons are a little below their middle positions, see Fig. 1.

If, in stopping, the momentum of the motor is overcome when the cranks are in any other position, the greater pressure in one cylinder will tend to make the motor oscillate back and forth until it stops close to the position of equilibrium mentioned. The above, of course, is on the assumption that the valves, pistons, etc., are fairly tight and that the friction of the engine is not too great.

Starting Without Cranking

Immediately after the motor has stopped in this position, let us see what is necessary to start it without cranking: Assuming that the switch is thrown to the battery side, first suppose the ignition lever is advanced so that the timer makes contact 90 degrees early and causes a spark in the cylinder whose piston is on the compression stroke or coming up. The explosion caused thereby would, if of sufficient force, turn the motor backward. Close to the bottom of the stroke, the exploded charge would be released by the opening of the inlet valve—not exhaust valve—and the result would be a puff back through the carbureter. If enough of a start has been given to the motor in this backward direction, the other piston which was supposed to be on the explosion stroke, will have been carried over the top center and will be fired when it reaches the point 90 degrees below the center. This, in turn, will still further increase the motor speed backward. Following yet further, it will be seen that the piston which normally would have been on the exhaust stroke, has backed up, sucked a charge into the cylinder from the exhaust manifold, and, if this charge were explosive, is ready to fire it the same as the others have done. Where the muffler has been well filled with explosive mixture before the motor stopped the writer has known of the motor getting as high as four or five explosions when turning backward. This, of course, is undesirable.

Going back again to the condition where the motor stopped, suppose the timer is retarded until a spark is caused in the cylinder whose crank is 90 degrees past top center and on its normal working stroke. The explosion caused thereby will, if sufficiently strong, carry the following piston over the top of its compression stroke; that charge will in turn be fired and so the regular cycles will be continued. The ignition should be advanced to the running position as soon as the motor is started.

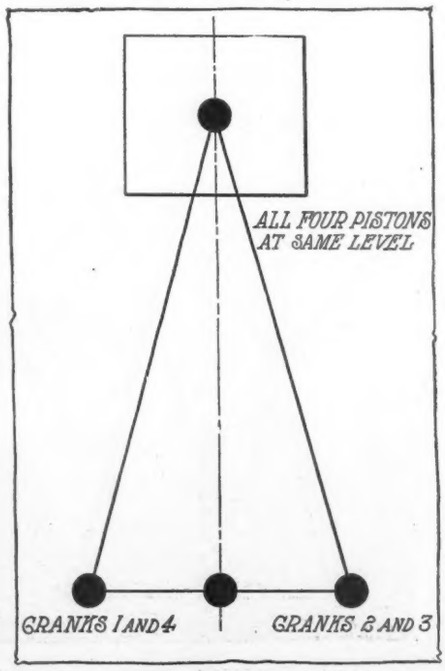


FIG. 1

We have thus shown the first essential is to be able to cause a spark in the cylinder next to fire, even after its crank has gone as much as or even more than 90 degrees past center, since the motor is liable to stop in that position if there be any considerable friction. An essential equally as important as the spark, is that the mixture contained in the cylinder shall explode with sufficient force to throw the motor over the following dead center, otherwise it will stop and back up before the second piston is in position to be exploded.

Let us stop at this point for a minute to consider some of the things that determine the first explosion. The carbureter should be examined first to see that it delivers a sufficiently strong mixture at the time of stopping or at very low speeds. When the mixture is strong enough for slow running, it will usually ignite and explode with considerable force if a spark is passed through it before it has stood long. If allowed to stand for any length of time, however, the charge tends to become more or less stratified and the upper portion of the charge weakens to a certain extent. Again, some cylinders do not properly discharge all of the exhaust gases and these after standing become mixed with the fresh charge and prevent its being ignited. If the motor is allowed to stand too long, condensation of the gasoline will take place and the mixture will be thus weakened. Many carbureters are furnished with a choke valve of some sort at the air inlet to facilitate easy starting and if this valve is connected so the driver can close it more or less from the seat, he can in many cases so proportion the mixture in stopping that it will be in the most suitable condition when he is again ready to start. It should be remembered that too rich a mixture will fail to ignite the same as too weak a mixture, consequently the strengthening of the mixture should not be overdone unless the car is expected to stand some time before starting.

Position of Spark Plug

The position which the spark plug occupies in the cylinder undoubtedly has something to do with the length of time which the motor may be left standing and yet start upon the spark. However, in spite of this fact, the mixture may often be so proportioned by the means suggested as to overcome the difficulty caused by poorly located plugs.

The pressure of the charge at the time of igniting has much to do with the pressure developed, but it should be remembered that when any degree of compression has been retained by the cylinder which fires first, the chances are that the cylinder which is then compressing has also retained an equal amount of compres-

sion which has to be overcome by the first explosion, thus partially, although not wholly, offsetting the benefit gained by the pressure in the exploding cylinder.

That the retaining of compression is absolutely essential to starting on the spark, is a mistake, as has been proven by the fact that motors will start after the pet cocks have been opened and any remaining compression thus relieved. Again, one occasionally reads accounts of exceptional cases where motors have started on the spark even after the inlet valves have been temporarily removed for inspection.

If one cylinder has a leaky valve or any other means by which the pressure is lost rapidly, it will be found that the motor may no longer stop at the normal position, but may stop in almost any position. If this happens to be with the exploding cylinder just past upper center, so much the better. But the chances are that it will more often be just before the bottom center, where the exhaust valve is open and the explosion of this charge will do no good. The remedy in case of leaks is obvious.

Assuming that the matter of mixture is well enough understood to need no further comment, let us take up the matter of the spark: If a four-unit coil is used, it is almost essential that the contact for causing the first spark be made at the timer, and for this reason there should be a sufficient range provided to allow of getting contact approximately 90 degrees late, preferably later. Some cars have a stop which prevents retarding the ignition later than that desired for starting with the crank, namely, dead center or a little after. If this be the case and the reader cannot contrive some way in which he can alter the construction so as to get the necessary range, he might as well give up the idea of starting on the spark.

Some cars which use only a single-unit coil in connection with a distributer have the necessary means for causing the late spark, but do not so proportion or set the distributer as to take advantage of this wide range. The writer was somewhat surprised when he learned that this was the case with one of the best-known makes of magneto on the market at the present time. To determine in any case whether this is the cause of the trouble, set the motor on center and determine which cylinder is receiving the spark. Then retard the timer lever as far as it will go, and, by slowly turning the motor, determine whether the spark continues to actually go to the same cylinder until its crank has gone at least 90 degrees over the center. Sometimes, as with the magneto referred to, the coil vibrator will buzz, but the spark occurs at the safety gap or never reaches the cylinder. In other cases where the distributer is not properly designed or set, the spark will, when the timer is greatly retarded, go to the cylinder which should fire next in order. Again, if set so

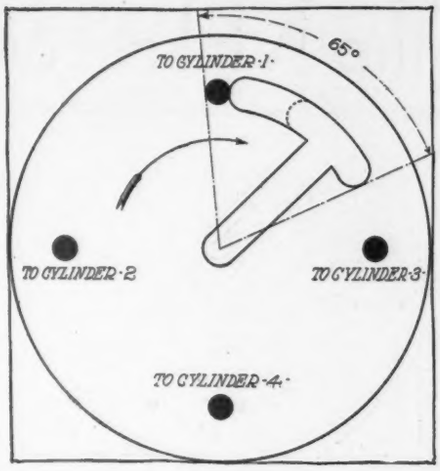


FIG. 2

that it delivers the spark to the proper cylinder with the timer in the very late position, it may, when the lever is advanced to the full extent, deliver the spark of the cylinder which should have fired just ahead of the one in question.

Setting of the Distributer

In order to make clear the design and setting of a distributer, let us refer to Fig. 2 and consider the essential points. Here it is assumed that the four terminals corresponding to the respective cylinders are stationary, since in this type only should there be any doubt as to the proper manner of setting.

To start with, consider what is desired of the distributer. When the motor is running at high speed, the spark should be led to the proper cylinder at least as early as 40 degrees before dead center. If batteries alone are used, this should be increased to 60 or 65 degrees, but since magnetos are so generally used at the present time, the smaller value—40 degrees—will be accepted as sufficiently early. In starting on the spark, we found that provision should be made for at least 90 degrees late or after center. Assuming these values as limits, we find that the distributer should deliver the spark to the same cylinder throughout the entire range of 130 degrees of the crank or 65 degrees on the distributer disk. As shown, it will be found that the segment is in actual contact with the terminal to any cylinder for the full range, or that if it is set so that the segment first makes contact with the terminal when crank is 40 degrees ahead of center, it will just leave contact with that same terminal when the crank is 90 degrees past that same center.

Advises Against Longer Segment

Perhaps the reader will say, why not make the segment longer still, so that it will touch the terminal even if the motor happens to stop with the crank past 90 degrees? This should not be done with a distributer of ordinary size, for the reason that when running with a wide open throttle and spark fully advanced, the spark is liable to jump back to the terminal just passed, rather than leap the gap at the proper plug, which is under compression, even though the segment is in actual connection with the latter. It should be remembered that a current will prefer to jump a gap of approximately ⅞ inch in air rather than one of 1/32 inch under considerable compression. With the terminals placed on a circle of 2½ inches diameter, and the segment of such length as to make actual contact during the full 130 degrees, it will be found that there never is more than about ½ inch gap between the segment and the adjacent terminals. Even this small gap is perhaps getting too close to the danger limit, and, as there seldom is much compression in the cylinder when starting on the spark, we will be safe in cutting some off the trailing end of the segment and counting upon the spark jumping this gap when the ignition is set so late. In this way the danger of the spark going to the wrong cylinder is lessened. In the case of the magneto mentioned, the segment had, apparently for the above reason, been shortened approximately, as shown dotted, and the gap thus formed was so great that the spark would refuse to jump it with the engine in the usual stopping position. That the segment could in this case have been safely made longer without getting into difficulty, was proven, since the trailing end of the segment upon a number of magnetos was lengthened, thus making it easy to start upon the spark, and no difficulty was experienced when the ignition was fully advanced.

Push Button Sometimes Provided

In some cases where the ignition lever cannot be retarded as late as 90 degrees, a separate switch or push button is provided for causing the first spark regardless of the position of the timer or engine. With the magneto mentioned, the push button upon the coil box was so connected that, as long as the button was pushed in, the battery current continued to pass through the vibrator and a continuous stream of sparks was delivered to the distributer segment. With this arrangement it was advisable to give only one quick push to the button, since otherwise, even though the first cylinder received its spark and started the engine, the following cylinder would receive its spark as soon as the segment came close enough to its terminal for the spark to jump across to it. This would of course mean entirely too early, and the result would be that the engine would kick backward and stop. By releasing the pressure on the button immediately, the second cylinder would get no spark until the proper time as determined by the contact breaker on the magneto.

With two or three-cylinder motors, it is of course useless to count on starting upon the spark, since the chances of the motor stopping with a piston close to the beginning of its working stroke is very remote.

Among the Makers and Dealers

ADDITION THAT HAS JUST BEEN MADE TO REGAL PLANT IN DETROIT

New Ford Agent—The Superior Motor and Machine Works, of Superior, Wis., is a new Ford agency in northern Wisconsin.

Doubling Capacity—The La Crosse Rubber Mills, of La Crosse, Wis., is gradually doubling the capacity of the plant and by May 1 the output will be increased 100 per cent. An addition will be built next spring.

Are Pope-Hartford Agents—Williams & Schlereth, a partnership consisting of R. O. Williams and J. J. Schlereth, have opened a garage and repair shop at 753 East Long street, Columbus, O. They will act as agents for the Pope-Hartford.

Staley Moves—Frank Staley, manager of the Studebaker Brothers' Indianapolis company, has moved into his new headquarters in North Pensylvania street in Indianapolis. The company has four floors of a six-story building just completed by Arthur Jordan at a cost of $124,500. Mr. Staley will carry the Studebaker line.

Thomas Company's Progress—According to the E. R. Thomas Motor Co., of Buffalo, the output of cars at that plant during the past year has been almost a third more than was at first contemplated. For this reason the concern has let contracts for a large addition to its factory and has leased a part of the Century Telephone Co.'s plant. The Thomas company is using its plant No. 3 for the construction of taxicabs only. The new addition will be used to house the inspection department, tool stock room and small parts assembly and will also contain the factory office. The new addition will be 250 feet by 100 feet and will be of cement construction. It is estimated that the Thomas plant has a capacity for turning out twenty-five complete machines daily.

Representing the Mitchell — George Bremmer, of Portage, Wis., has been appointed representative of the Mitchell in Columbia county.

Starts at Barnesboro—The Hastings-Barnesboro Automobile Co. has been formed at Barnesboro, Pa., by H. J. Van Dusen, A. B. Clark, Joseph Vogel and C. H. C. Prutzman. The company has bought a site and will build a plant at once.

Factory Representative—The Johnston-Fetcher Motor Sales Co., of Denver, has become factory representative of the Metzger Motor Car Co., and will control the distribution of cars in Colorado, Wyoming, New Mexico, Utah, Idaho and Montana.

Kansas City's Latest—The L. C. M. Motor Car Co., of Kansas City, Mo., announced its organization this week with J. K. Lipscomb as manager, H. D. Clark, president, and M. J. McKinnon, master mechanic. The Palmer-Singer and the Simplex are represented. Headquarters have been established at 3816 Main street.

Silent Sioux Plant Moved—The Silent Sioux, a four-cylinder 40-horsepower car that has been built at Sioux Falls, S. D., since last spring, will in the future be manufactured at Waukesha, Wis. The concern, of which R. J. Wells is president, has leased the former plant of the Waukesha Motor Co., on North street, and its equipment is now being removed from Sioux Falls to Waukesha. Additional machinery is being purchased and the output will be increased to ten complete cars a month. T. L. Fenwick, a member of the company, will be in charge of the plant.

Boston Thomas Branch Moves—Manager C. S. Henshaw, of the Boston branch of the Thomas, has found a new and better location for salesrooms and next week he will move to Copley square, where he will be a neighbor of the Locomobile and Rainier.

New Columbus Concern—J. A. Taft, George E. Bazler and P. F. Wilkinson, of Columbus, O., announce that the McDonald Automobile and Livery Co., recently organized, will be the Columbus agent for the Buick. The concern will be located at 1084 North High street and also will handle the Welch-Detroit.

Takes P. & S. Agency—Walter Bemb, for many years with the J. H. Brady Auto Co., of Detroit, has severed his connection with that firm and has established an agency at 290 Jefferson avenue, Detroit, at which he will, under the name of the Bemb Auto Sales Co., handle the Palmer-Singer cars which have been hitherto unrepresented in Detroit.

St. Louis Combinations—The Vogel Motor Car Co. of St. Louis has combined with the Dougherty Electric and Machine Co. and the J. H. Bledsoe Auto Co., and all are located at Garrison avenue and Olive street, with a welding plant at Twenty-third and Pine streets. The Lindsay Motor Car Co. has renewed its contract with the Inter-State Automobile Co. to handle the Inter-State car. A. J. Lindsay is president of the company and H. M. Payne is secretary and manager.

Newcastle Ambitious—Newcastle, Ind., which some time ago obtained the big plant of the Maxwell-Briscoe Motor Co., is now going after the manufacturers of motor car parts. Quite recently the National Spring Co. was organized and is building a plant. Now the Adrem Motor Co. has been organized with an organized capitalization of $3,000 and will build motors. Those interested in the company are J. D. Smith, H. E. Jennings, H. C. Yauky, W. C. Bond, H. F. Burk, D. W Kinsey and H. C. Chase.

Ricketts a Veteran—Richard Ricketts, who has twenty-three states for the Ricketts Automobile Co., of South Bend, with headquarters in Indianapolis, claims to have built one of the first motor cars ever built in the world. In 1858, he states, he built in England a steamer capable of carrying three passengers and an engineer. The car had a direct drive to the rear axle, with a worm gear steering device. He built two more cars in 1860, which were exhibited before Queen Victoria. In 1861

the English parliament passed a law prohibiting road locomotives from using the public highways.

Building New Factory—A new factory is being erected in Milwaukee, Wis., for the Cream City Trimming Co., a manufacturer of tops, etc., at 613-615 Market street.

Small Show at Carlisle—Twenty-two different models were displayed at the recent 1-day show held in Carlisle, Pa., by the Motor Mart, of which B. Leroy Plank is president. The various makes represented included the Reo, Stoddard-Dayton, Maxwell, Cadillac, Peerless, American Traveler, Studebaker-E-M-F, Buick, Pierce-Arrow, Knox, Pullman, Wayne, White steamer and Winton.

Willys Has Commercial Line—The Toledo plant of the Willys-Overland Mfg. Co. will branch out still further, according to the announcement of President Willys. The company will engage in the manufacture of commercial motor trucks of all kinds, delivery wagons for light work and heavy trucks. Work will be started as soon as possible in the spring on another large new building to take care of this department. The plant is now turning out from thirty to forty cars daily, is employing 2,000 men with a daily payroll of more than $5,000.

Quaker Trade Changes—Trade changes in Philadelphia continue to come thick and fast as the end of the year approaches. The Thomas Flyer, formerly handled by the Bergdoll Motor Car Co., and which has been unrepresented in the Quaker City for the past few months, has been acquired by Frank J. Fanning, formerly of the Chalmers-Fanning Co., who has secured an option on a prominent row location, where he will exploit the Thomas and the Mercer, the latter a recent acquisition from Trenton. Harry L. McCullough has been appointed manager of the Continental Motor Car Co., which recently acquired the local rights for the Speedwell and Parry cars; he is now located at 1541 Land Title building until extensive alterations are completed on the building at 1416 Vine street. The W. Wayne Davis Co., representative of the Metzger Motor Car Co., is now looking for a suitable location for its branch house on the row, where will be installed the Everitt, for which it is distributer and factory representative for southeastern and western Pennsylvania, Delaware, Maryland and Virginia; meanwhile business is being carried on temporarily at 207 North Twenty-second street. D. P. S. Nichols, Broad and Vine streets, has recently acquired the agency for the Martin commercial wagons. The Thomas Wagon Co., 1338 Race street, has just taken on the Hart-Kraft commercial delivery, a York, Pa., product. A downtown garage at 1705 Jackson street has been awarded the agency for the Metz runabout. The Auto Repair and Sales Co., 911 North Broad street, is seeking capital to exploit a new car, the name of which will be announced as soon as the necessary financial arrangements are made.

BUILDING OPERATIONS OF MOLINE COMPANY AT MOLINE, ILL.

Gets the Kissel Line—The Hub Motor Co. will sell the Kissel and handle accessories and supplies at 810 Mulberry street, Des Moine, Ia. Its salesroom is 36 by 70 and has a concrete floor.

Smith with Studebaker—Thomas Smith, of Chicago, will have general charge of the new branch established by the Studebaker Automobile Co. in the Colby-Abbot building, Milwaukee, Wis. William F. Sanger will be sales manager, but he will retain his connection with the Sanger Automobile Co.

Continental Agents—The Indiana Motor Sales Co., Indianapolis, Ind., controlling the Continental 35, has appointed the Reliable Auto Exchange, Indianapolis, Ind., state agent. This agency takes 100 cars. The company has appointed More Brothers, Wimbledon, N. D., agents for the Continental in North Dakota and part of South Dakota.

In a $50,000 Building—The Waukesha Motor Co., of Waukesha, Wis., is now housed in its new $50,000 factory building at Keeley and St. Paul avenues. Fifty men are already employed, although not all departments are ready for use. The company is confining its activities to the production of a standard four-cylinder, 40-horsepower motor, known as the Waukesha and has received some good contracts in the last month. A recent contract is from the Sioux Motor Car Co., which has removed its plant from Sioux Falls, S. D., to Waukesha, where it occupies the motor company's former plant.

Big Order for Trucks—A. W. Norris, J. P. King and F. T. Hepburn, of the Norris-Toledo Sales Co., were in Bowling Green, O., last week, where they placed an order for sixty trucks costing approximately $130,000, with the Gramm-Logan Motor Car Co.

Repairs a Feature—Schober Brothers, of Waukesha, Wis., have started work on a garage and repair shop on Main street, to have dimensions of 40 by 82 feet, one story high. Repairs will be the feature of the business, the garage being a secondary business.

Poppenberg's Big Territory—Albert Poppenberg, of Buffalo, who has the western New York agency for the Studebaker E.-M.-F., reports that more than $500,000 worth of the Studebaker product will be distributed from the Buffalo branch. He has established four agencies in each of ten counties of western New York.

Old Board Reëlected—At the annual stockholders' meeting of the Barndt-Johnston Auto Supply Co., of Columbus, Ohio, the old officers and directors were reëlected for the coming year. C. Christian Born is president, Walter R. Johnston vice-president and Charles F. Barndt secretary-treasurer. The plant is located on Donaldson street and makes a specialty of bodies and other motor accessories. It was decided to enlarge the shops and other facilities, and more than $100,000 will be

CARTERCAR PLANT AT PONTIAC, MICH., COVERING 5 ACRES OF LAND

expended in that manner. The company has been making a large number of taxicab bodies.

Takes on the Oakland—The Tanberg Auto Co., of Eau Claire and La Crosse, Wis., western Wisconsin representative of the Buick, announces that it has taken on the Oakland.

Oil Company Organized—The Bailey Oil Co., of Toledo, O., will engage in refining and marketing lubricating oils, with its offices in the Ohio building. The company's present refinery is located at Warren, Pa., and it has branches at Chicago and Kansas City. A steel repository will be erected in Toledo.

House-Warming in St. Louis—Hundreds of dealers and owners in St. Louis, Mo., were entertained at the house-warming Saturday of the Phoenix Auto Supply Co. The firm has just moved into its new building at 3972-74 Olive street. Refreshments were served, there was music, and in the evening there were addresses by officers of the company and by others present. The Phoenix owns its building, which is new throughout.

Dorris in Good Shape—The Dorris Motor Car Co., of St. Louis, has its plant well equipped with special machine tools and such jigs, fixtures, etc., as to permit of interchangeable work. According to President H. B. Krenning, the product for 1910 is placed and deliveries will be made on time. Dorris cars, as they are to be placed in the hands of 1910 users, will have many little refinements, nearly every part being made in the Dorris shop.

New Factory for Colburn—The Colburn Automobile Co., of Denver, will begin, shortly after the new year, the erection in this city of a new factory to cost between $50,000 and $60,000. The site has not yet been selected, but it is understood that one near Overland park is favored by the management of the company. Sales Manager Bert E. Colburn estimates that about 500 cars will be built next year from the new factory. The Colburn company began manufacturing cars in a small way in 1906. Parts of the Colburn car, which are now being imported from France, will in future be made in Denver.

Barclay Is Added—The Studebaker Automobile Co. has added to its Louisville working staff John Barclay, formerly connected with the Warner Speedometer Co. Mr. Barclay will have charge of the retail sales department of the branch.

Wired for Electricity—All Pierce-Arrow cars are wired for electric lamps, and a separate battery outfit is provided. A switch under one of the tool compartments on the dash turns these lights on and off. The lamps are also provided with oil burners, for use should the owner prefer them.

Goodyear Has Doolittle Rim—The Goodyear Tire and Rubber Co., of Akron, O., has secured the sole right to sell the Doolittle demountable rim in the United States, which rim will be marketed through all of the Goodyear branches and agencies. Demonstrating stands will be fitted in all the branches and agencies for the exhibition of this rim.

Worthing Retires—The Worthing-Clark Automobile Co., of Fond du Lac, Wis., has been reorganized, George W. Worthing retiring. The name of the concern has been changed to E. W. Clark Motor Co., and the capital increased from $20,000 to $30,000. E. W. Clark is president and manager. The company originally was the outgrowth of the E. W. Clark Vehicle Co. and recently built a large garage at Fond du Lac.

Is Distributing Center—The phenomenal increase of business which necessitated the removal of the Philadelphia Studebaker branch house from the row to Eighteenth and Hamilton streets, has been recognized by the Philadelphia and Reading railway by the erection of a freight yard at the latter's expense to facilitate shipments to and from the big establishment. The new yard is diagonally across the street from the Studebaker quarters and will serve as a general distributing station for that portion of the Studebaker output destined to points in eastern Pennsylvania, southern New Jersey, Delaware and a portion of Maryland.

Early Company Organized—The Early Motor Car Co., of Columbus, O., will open its new salesroom near the corner of High and Town streets with a line of Ramblers and Babcock electrics.

Talks on Batteries—An illustrated lecture upon the care and operation of Exide batteries in electric vehicles was delivered in Detroit, Mich., on December 9, by Bruce Ford, engineer of the department of development and design of the Electric Storage Battery Co. The lecture was given under the auspices of the Edison Illuminating Co., of Detroit.

Will Handle the American—The American Auto Co., of Columbus, O., with a capital of $3,000, was incorporated by William Bucher, C. W. Cain, Laura B. Levering, W. S. Siebert and J. H. Thomas, for the purpose of conducting an agency for the American. The concern will be located in a new show room at Fourth and Spring streets with the Columbus branch of the Charles Schiear Motor Car Co. C. W. Cain will be general manager.

Advertising Men Confer—Fourteen representatives of the advertising departments of the same number of licensed makers met December 7 in New York to consider the advisability of forming a permanent organization, to meet periodically for the discussions of problems of mutual interest. A committee composed of Arthur N. Jervis, Charles W. Mears and K. P. Drysdale was appointed on permanent organization. R. H. Johnston and C. A. Stein were elected temporary chairman and secretary respectively.

New in Minneapolis—Four new lines entered the Minneapolis field the first 8 days of this month. This makes Minneapolis distributing center for nearly every prominent western gasoline, steam or electric car or truck. The four lines are the Continental, which has been taken by the Motor Sales Co.; the American Simplex, the Black Crow and Everitt 30. The MacArthur-Zollars-Motor Co. is in the course of formation with $50,000 capital and it will take on the Simplex, Black Crow and Everitt gasoline cars and the Babcock electric.

Will Visit Buick Plant—A trip, which is the first of its kind ever arranged on so large a scale by any distributer in the northwest has been planned by H. E. Pence, of the Pence Auto Co., Minneapolis. This is a trip by northwestern Buick agents to the Buick factory at Flint, Mich., where the men will be guests for 5 days. Invitations have been extended to all Buick agents in Minnesota, the two Dakotas, part of Montana and the western part of Wisconsin, all their expenses to be paid by Mr. Pence. The party will meet in Minneapolis in time to leave for the Michigan city December 28 and it is expected that at least 125 dealers

STORE OF THE COVEY MOTOR CAR CO. AT PORTLAND, ORE.

from various parts of the territory handled by the Pence Auto Co. will take advantage of this opportunity.

Welch Inter-State Manager — C. J. Welch, formerly of E. R. Thomas Motor Co., Buffalo, N. Y., has been appointed sales manager of the Inter-State Automobile Co., Muncie, Ind.

Wright in Charge—Frank V. Wright, formerly owner of the Capitol garage, at Cheyenne, Wyo., has assumed charge of the gasoline garage just started by the Place Garage Co. in connection with the electric garage now located at 1461 Clarkson street, Denver.

Minneapolis Branch Opened—The Goodyear Rubber Co.'s Minneapolis branch is now completely furnished and formally opened its office early this week. A large stock of tires which will be carried is en route from the factory at Akron. G. C. Faling will be in charge as local manager.

Marmon Output Increased—It is reported that the Nordyke & Marmon Co. already is feeling the result of the recent victories of the Marmon cars at race meets. The company planned originally to build 500 cars during the coming season, but it is said that orders for 750 additional cars have been received and that the company will be obliged to increase its output accordingly.

Company Reorganizes—The Consolidated Mfg. Co., of Toledo, which has been in the hands of a receiver for some time, has been reorganized under the same name by Charles F. Chapman, Frank W. Coughlin, Eugene N. Winkworth, Frank E. Miller and Edgar C. Hampton with a capital stock of $225,000. The concern will manufacture motor cars and will have the new cars on the market in a few months, according to its announcement.

Remy Branch in Frisco—The Remy Electric Co. has established a branch distributing office at San Francisco, Cal. A complete line of magnetos, fittings and parts are carried in stock. The San Francisco branch will also carry in stock fittings for the following cars: Buick, Maxwell, Ford, Stoddard-Dayton, Thomas, Chalmers-Detroit, Cadillac, Oldsmobile, Winton, Rambler, Reo, Mitchell, Knox, Pullman, Rapid truck, Pope-Hartford Corbin, Franklin, and Hudson. The branch is located at 170 Golden Gate avenue.

Activity in Kansas City—More agency activities are reported from Kansas City this week. The Lake Motor Car Co. now handles the Standard six. Fred Ryer and Julian Peycke, under the firm name of Ryer & Peycke, become successors to A. L. Bennett & Co. as Petrel representatives at 1900-1902 East Fifteenth street. The Goodyear Tire and Rubber Co. has placed an agency in Kansas City under the management of C. W. Holcker, of the Holcker-Elberg Carriage Co., Sixteenth and McGee streets. The Stafford Motor Car Co. has been organized to make cars in Kansas City. The company now has an assembling plant in Topeka, Kan. A capital of $100-000 in the company is reported to be fully paid up.

NEW STORE OF PHOENIX AUTO SUPPLY CO. OF ST. LOUIS

On Road for Universal—F. A. Holmes, of Chicago, has taken the road for an eastern trip in the interests of the Universal Rim Co.

Start the Light Company—The Light Motor Wagon Co. has been incorporated in Milwaukee, Wis., with a capital stock of $10,000. H. A. Richards, O. R. Kaddatz and B. E. Malone are the moving spirits in the concern.

Badger Doings—The Holloway Auto Co., of Monroe, Wis., has established a large repair shop for all kinds of machine work and rebuilding. L. J. Kaestner, of Plymouth, Wis., is erecting a building at Smith and Edna streets, to be used as a motor car repair shop. The Silo garage, 220 Front street, Beaver Dam, Wis., sustained a loss of $2,500 by fire of unknown origin last week.

Greenfield Bids for Plant—An effort is being made by citizens of Greenfield, Ind., to sell sufficient stock to obtain the plant of the Leader Automobile Co., now located at Knightstown. Luther R. Frost, the largest stockholder of the company, lives in Greenfield, and states he is willing to have the plant moved to that city if Greenfield citizens will subscribe for sufficient Rim Co., of Chicago.

New Speedwell Agencies—The following agencies for the Speedwell cars have just been added in the west: Capron-Wright Automobile Co., Omaha, Neb.; H. G. Carter, Los Angeles, Cal.; Hickman & Diggs Automobile Co., Sacramento, Cal.; Racine Auto and Boat Co., Seattle, Wash. The following agencies have been added in the south: Speedwell Motor Car Agency of Alabama, Birmingham, Ala.; J. B. Alsop, Richmond, Va.; W. W. Lynn, Lynchburg, Va.; Gentilly Automobile Co., New Orleans, La.; Houston Electric Appliance Co., Houston, Tex.; Edward Moyle, Savanah, Ga.; T. W. Simpson, Abilene, Tex.; Escambia Motor Car Co., Pensacola, Fla.

Childress is Manager—B. M. Childress writes that he is manager of the Jackson Motor Car Co. of Dallas, Tex., instead of George Clark, as stated recently in Motor Age. The Jackson company has given up the Jackson and now is state agent for the Brush.

New Company for Baltimore—A new company has been organized in Baltimore by W. Arthur Norwood, Herman Norwood, and George G. Norwood, under the name of Norwood Brothers, Inc., handling the Velie. The capital stock is $25,000 with $15,000 paid in. The company has purchased a four-story brick building at 4416 Madison avenue, with a storage capacity for seventy-five cars.

Will Make Magnetos—The Duplex Coil Co., of Fond du Lac, Wis., has decided to produce magnetos after January 15. Drawings and patterns for the new device are completed and additional machinery is now being installed. The magneto will be trade marked Duplex. It will be necessary to construct an addition to the factory next spring, as the present facilities are already inadequate for the regular business of manufacturing coils and other devices.

More Room for Regal—The Regal Motor Car Co., of Detroit, has moved into its spacious new addition to its plant. The new building has 475,000 square feet of floor space, is four stories high and the first floor is occupied by the offices, which are light and airy, being finished throughout in the mission style, with beamed ceilings. The Regal company now has in course of construction a new brick and stone machine shop, size 98 by 168 feet, and is forced to continually extend itself to provide floor space to facilitate the turning out of the Regal 30.

Manufacturers' Communications

Springs For Motor Wagons

DETROIT, MICH.—Editor Motor Age—The importance of properly proportioning the springs to be used on commercial power wagons does not seem to have been given the amount of attention it deserves. It does not matter how well a car is designed or how well built it is, yet if springs are used which do not possess sufficient resiliency combined with the necessary flexibility to take care of the extremes of load, the car will very soon show the effects of jarring and the operator will note at once that rivets and bolts all over the car are becoming loose. This, of course, is a grave danger and in some types of cars means that there is a very great possibility of parts being lost on the way, not to mention the danger to the occupants of the car. Of course, the solid tire is not as resilient as the pneumatic and this fact must be taken into consideration and provided for in designing the springs.

In the early stages of the industry, designers were apt to make either one of two mistakes. They either copied the crude construction of the horse-drawn truck and had their springs too stiff and built of too poor a material or else made the equally bad mistake of copying the pleasure-car construction. As most of the data available at the present time pertains to pleasure-car construction and the few sources of information regarding commercial-car springs are not the most reliable, the results of the following experiments will no doubt be of interest.

At the present time there is a wide divergence of opinion as to which is the most suitable form of spring construction.

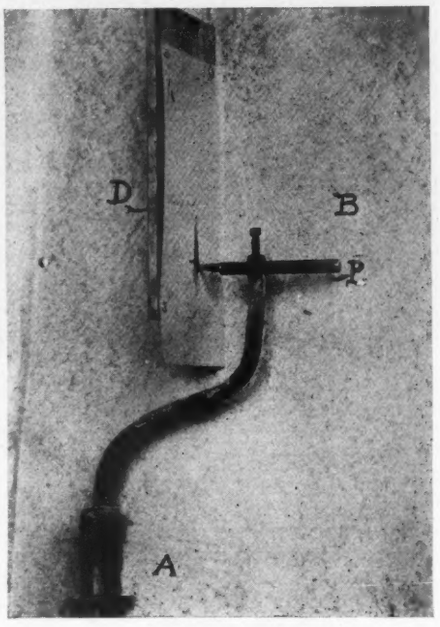


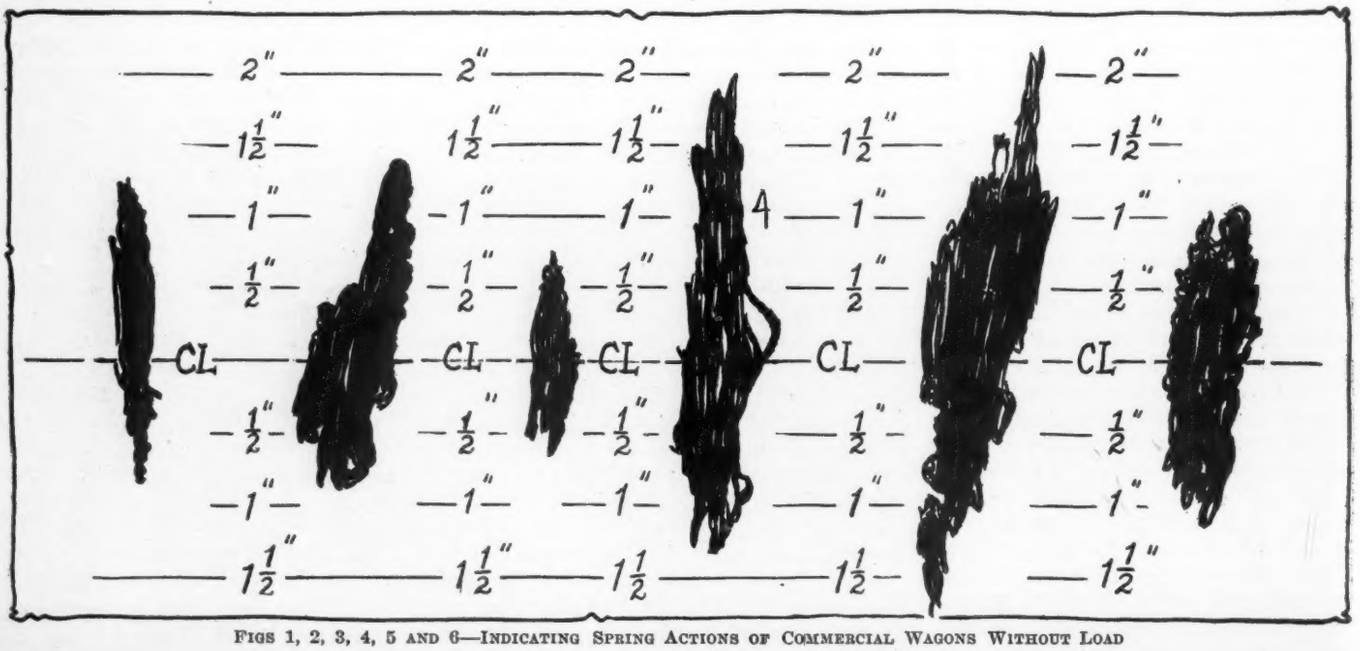
FIG. 1—SPRING ACTION RECORDER

Looking at the different makes of cars on the market today will reveal the fact that seldom two designers have the same idea, although most of them seem to favor the half-elliptic for the front with a division of opinion as to whether the platform or half-elliptic should be used on the rear.

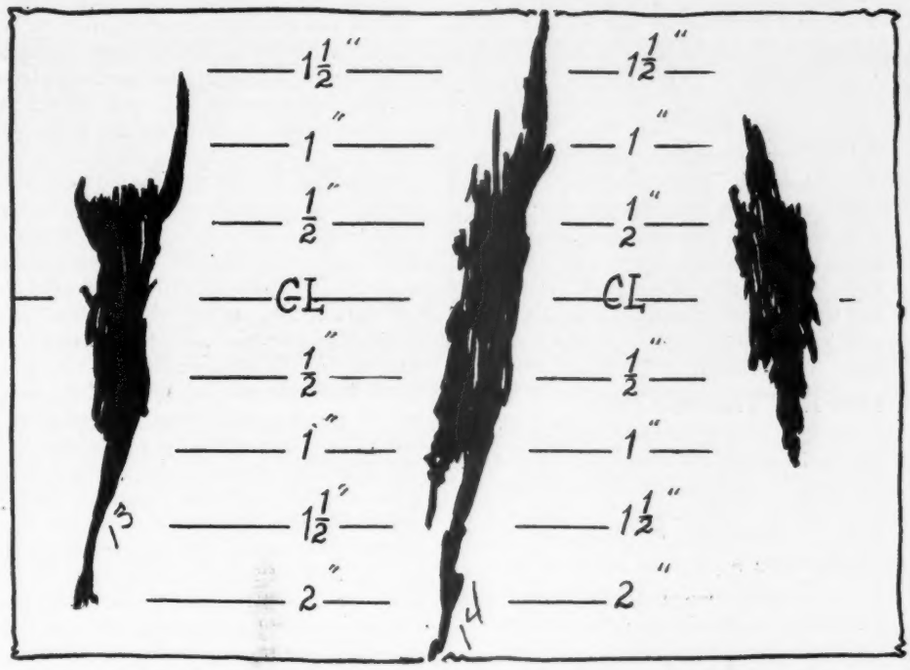
After having experimented for some years with all the different combinations of platform, elliptic and half-elliptic, we have come to the conclusion that the preferable form of construction for commercial power wagons is either half-elliptic both front and rear or half-elliptic front and platform rear, the latter form being the most desirable. It is from a series of experiments with this style of spring that the following material was selected. The cards and data were obtained from our experimental files.

The commercial wagon spring is called upon to work under widely varying conditions in the course of a day's travel. At one time—it is travelling along slowly with its full load on a smooth pavement and probably on its next trip out it will be light, and there arises a temptation to the driver to speed it up regardless of road conditions. Consequently, it is imperative that the springs should meet this emergency.

To properly compare the merits or demerits of different types of springs, it is necessary to have a graphic representation of their movements under the different working conditions met with on the average American road. For this purpose, we used the recorder illustrated in Fig. 1, an inspection of which will be self-explanatory. The lower end A is either clamped securely to the axle or can be fastened to the top of the spring by the clips. By varying the construction of the support, it can be attached at any position on the spring so that the action can be observed at any point desired. The upper end carries the recording pencil P which is held in place by a spring. This not only gives the necessary pressure to properly mark the card but also takes care of the slight side motion of the car which if not taken into consideration would greatly endanger breaking the instrument. The card D is attached with thumbtacks to a smooth



FIGS 1, 2, 3, 4, 5 AND 6—INDICATING SPRING ACTIONS OF COMMERCIAL WAGONS WITHOUT LOAD



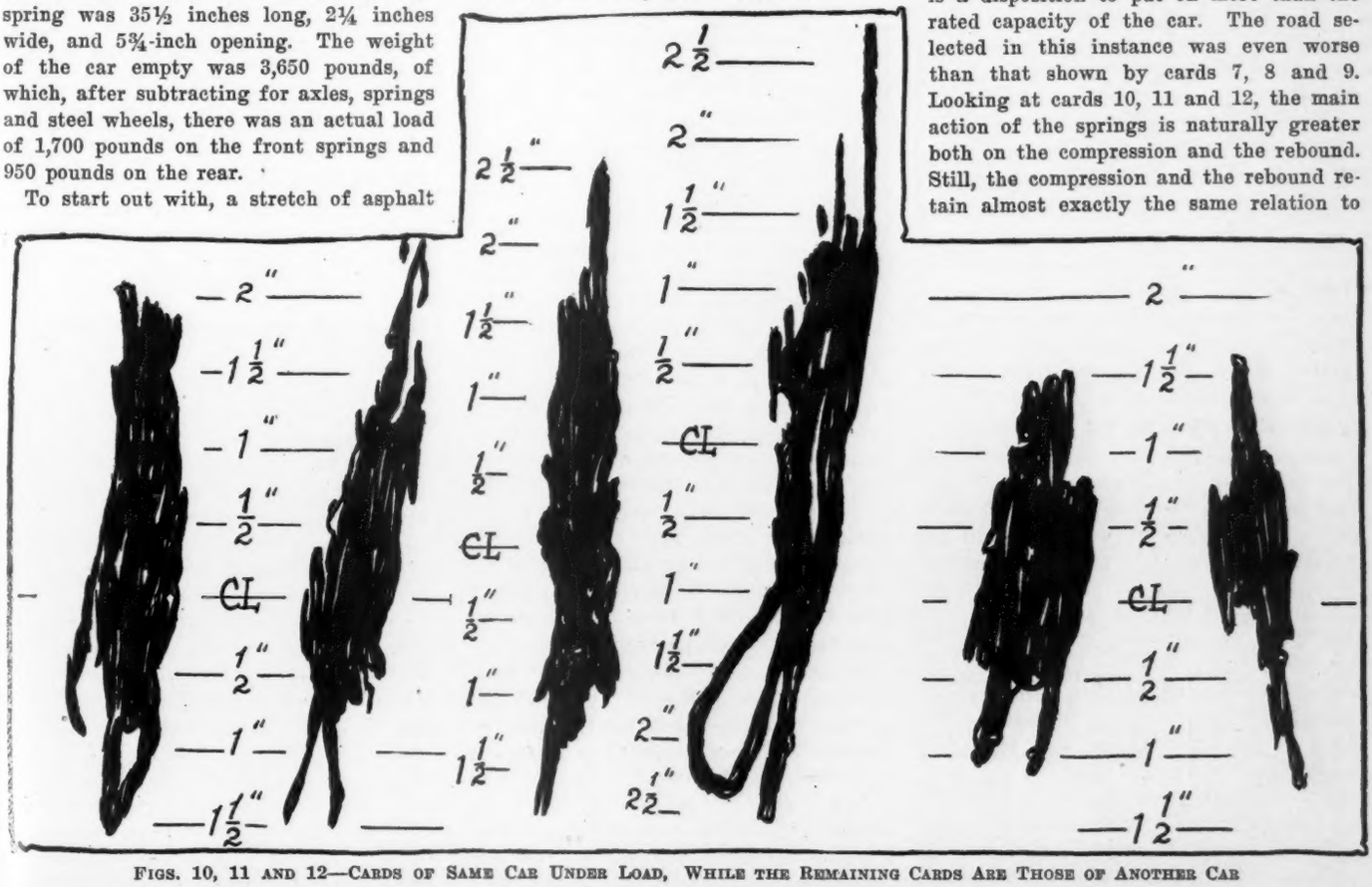
FIGS. 7, 8 AND 9—SHOWING CARDS TAKEN ON VERY ROUGH AND UNEVEN ROADS

board rigid with the frame of the car. The greater the care taken in making the cards and the attention given to little details, the better will be the results obtained. The car used was a 1-ton delivery wagon of 102-inch wheelbase, 56-inch tread, and equipped with 32 by 3½-inch solid rubber tires. The springs were half-elliptic front and platform rear. The front and rear side springs were 44 inches long, 2¼ inches wide, and 5-inch opening without a load on the car. The rear cross spring was 35½ inches long, 2¼ inches wide, and 5¾-inch opening. The weight of the car empty was 3,650 pounds, of which, after subtracting for axles, springs and steel wheels, there was an actual load of 1,700 pounds on the front springs and 950 pounds on the rear.

To start out with, a stretch of asphalt pavement was selected for the first three cards. This pavement had the usual amount of small holes or depressions which are unavoidable even on a well-kept road. The car was run over this road for some distance without any load at an average speed of about 15 miles per hour. Card 1 is the front side spring, cards 2 and 3 are the rear side and rear cross springs respectively. These cards show the springs riding very easily with a normal motion and with but very little rebound.

A block-paved street which had passed its initial stage of smoothness was next experimented upon, as shown by cards 4, 5 and 6. The cards in each series follow the same rotation. Here it will be noticed that the main action of the spring is somewhat greater, although preserving the same characteristics regarding the compression and the rebound. The same is also true regarding cards 7, 8 and 9, taken a short time later while passing over a stretch of very rough and uneven road, which also included crossing a railroad track, the springs at all times fulfilling the requirements necessary to make the car easy riding. The foregoing experiments were all made without any load on the car.

In order to complete the series a full load of 2,550 pounds was put on the car, distributed as evenly as possible. The total weight of the load and car was 6,200 pounds, of which, after making the proper deductions for springs, wheels and axles, there was a net weight of 2,000 pounds carried on the front set of springs and 3,200 pounds carried on the rear set. This load caused the front set to close ⅞ inch, while the rear closed 3 inches. This must be borne in mind was 25 per cent overload on the rated capacity of the car. The rear cross spring settled 2⅛ inches. The same figures for a load of 2,000 pounds were ¾ inch closing for the front, 2¼ inches for the rear side, and 1¾ inches for the rear cross spring. It was thought advisable, however, to make the test with the overload, our experience being that with most owners of commercial wagons there is a disposition to put on more than the rated capacity of the car. The road selected in this instance was even worse than that shown by cards 7, 8 and 9. Looking at cards 10, 11 and 12, the main action of the springs is naturally greater both on the compression and the rebound. Still, the compression and the rebound retain almost exactly the same relation to



FIGS. 10, 11 AND 12—CARDS OF SAME CAR UNDER LOAD, WHILE THE REMAINING CARDS ARE THOSE OF ANOTHER CAR

each other that they did before. The extremely long markings m were done when the car was driven rapidly across a high railroad track and went through a deep depression just after crossing, causing the excessive motion of the springs. A careful measurement of the spring openings after the experiment showed that there was no perceptible permanent set in the springs.

For the sake of comparison, we have included an odd set of cards taken from another make of car. This car was equipped with platform springs front and rear, the sides being each 36 inches long and the cross springs 37 inches long. These springs were 2 inches wide and 7 inches open without a load and with a load of 2,000 pounds they closed but 1¾ inches. The rated capacity of this car was 1 ton. Although the cross springs are by no means short, in fact a trifle longer than the other cross springs under discussion, yet on account of the poor material employed and the stiff construction necessary to make this same poor material stand up, it produced a very jerky movement of the car which made it a veritable rough-rider. These springs were about the usual kind of stock used in ordinary wagon construction and a spring of this type will not stand more than 1 week's service before showing a permanent set of from ½ inch to ¾ inch, which was the case with the above. This permanent set increases rapidly until almost all spring action is lost and the car bumps and jerks along until one wonders why it does not shake itself to pieces. A careful inspection of the working parts will show that is what is actually taking place and can be proven by looking at the loosening of nuts and rivets and the excessive wear on the working parts of such a car.

The foregoing data has been given in the hope that it will be of service in determining the proper spring suspension for moderately heavy cars. There is no hard and fast rule by which a spring can be constructed and the individual needs of each separate type of car must be ascertained more or less by actual experiment, which if carried out along the lines suggested cannot fail to obtain the results desired.—Grabowsky Power Wagon Co.

TIRE-CARE IN WINTER

Akron, O.—Editor Motor Age—While the number of people who store their cars during the winter is small as compared with the number that used to, we still get reports of tire troubles in the early spring which we are unable to account for until we investigate and find out that the car has been allowed to stand for weeks at a time in a cold place on fully inflated tires. Owners do not figure that varying temperature may have caused oxidation, that oil may have been on the tires and softened them, or that the heavy weight resting on one spot seriously injures the tires and causes trouble. If an owner is bound to store his car without removing the tires, it is best to jack the wheels up off the floor and let some of the air out of the tire, as well as seeing to it that they are perfectly clean and free from oil. The best way, however, is to remove the tires from the wheels. The tubes should be taken out, thoroughly cleaned, painted with graphite, folded, covered and put away in a dark place where the temperature is always about 30 degrees. The shoes should be thoroughly clean and free from oil. If this is done, the owner will have tires as good when he puts them on as when he took them off the wheels, and ready for use.—H. S. Firestone.

FISK HAS THE BUILDING

Chicago—Editor Motor Age—We note in the issue of November 11 that Motor Age says the Maxwell-Briscoe Cleveland Co. has leased the entire building part of which it now occupies. Our Cleveland branch takes exceptions to this statement for the reason that the Fisk Rubber Co. occupies the greater part of the building and its lease on same has several years to run—Fisk Rubber Co.

NOT IN RECEIVER'S HANDS

Topeka, Kan.—Editor Motor Age—A report has been published throughout California and the west to the effect that our company is in the hands of receivers. This statement is absolutely false, in so much at the present we are making improvements in our factory and expect to increase our output.—Smith Automobile Co.

ARE SEPARATE CONCERNS

St. Louis, Mo.—Editor Motor Age—In an article in the issue of December 9 under the heading "Big Garage for St. Louis," Motor Age states that we have made a working agreement with the Park Automobile Co., which handles the Thomas, Chalmers-Detroit and Baker electric, for the erection of a large garage at Delmar and Clarendon streets. This article is rather misleading. We have secured from the city council an ordinance granting the privilege of building a garage at the corner of Delmar and Clarendon streets. While the building will be under one roof it will be divided into two separate garages, each 65 feet wide, 160 feet deep, two stories, one of which will be occupied by the Park Automobile Co. and the other by us, each business being conducted entirely separate and in its own quarters. We do not want our factories or others to have the impression that we will do a joint business with the other agent. We will simply have a garage erected for us and each concern has its own quarters and its own equipment.—C. F. & J. R. Brown.

SOUTH AS MOTOR MART

Syracuse, N. Y.—Editor Motor Age—We often hear the south exploited as a growing and important future motor car market. Without doubt there is foundation for this statement. The south is steadily growing industrially and only awaits greater development of its highways and further progress of the good roads movement already started to make it one of the great motoring sections of this country. Many of the cities of the south are rapidly assuming the activity industrially and commercially of northern and western centers. Interests are being centered not only in the development of the natural resources of the country but in the cotton industry, which through its many ramifications forms a gigantic enterprise. The cotton crop of 1909, according to the late report of the agricultural department at Washington, was second in size so far as dollars and cents are concerned, being exceeded only by the value of the corn crop. With cotton at 15 cents a pound the south at the present time might be termed rich. All of this is making for advancement in the motor industry, and without doubt the greatest and practically the only serious drawback at present is the lack of good roads. This movement has been well started, the interest in many sections is exceedingly keen, and the people are determined to be connected by main trunk highways with the north, east and west. This matter of goods roads once accomplished, the sale of motor cars in the south will show a rapid growth. At the present moment the bulk of the business of the south is on cheaper lines. This might naturally be expected, but it is not necessarily any criterion with regard to the future development of the industry in that section. The better grades of motor cars are steadily working their way into the south, and there are many instances of high-priced and expensive cars. As boomers some of the southern cities, notably Atlanta, are entitled to be placed on a par with the proverbial western towns. The manner in which the Atlanta show, for example, was made possible, the erection of what is destined to be one of the finest speedways in the country, the organization of a great good roads tour from New York to Atlanta and of numberless subsidiary tours, all centering in the city itself, only illustrate the interest and the activity which pervade the south.—F. R. Bump, Sales Manager H. H. Franklin Mfg. Co.

CORECTS HOLSMAN STATEMENT

Chicago—Editor Motor Age—Permit us to call attention to an error in the article "1910 Holsman Motor Buggy," which appeared in Motor Age, issue November 25. In that part of the article pertaining to the different speeds it is stated that the "reverse sheaves, S-3 engage with the tires on the rear wheels on either side when it is desired to go into reverse." There is a cut of this action also shown in Fig. 3. The reverse sheaves, S-3, are designed to engage with the steel channels on the rear wheels which are ground to receive them. The sheaves S-3 are also hardened and ground. They do not come in contact with the tires at all. As a number of persons would find fault with the construction as given, claiming that the reverse would cause undue wear on the tires, we will greatly appreciate a correction.—Holsman Automobile Co.